IN THIS ISSUE

STEEL The Metalworking Weekly

September 23, 1957
Vol. 141 No. 13

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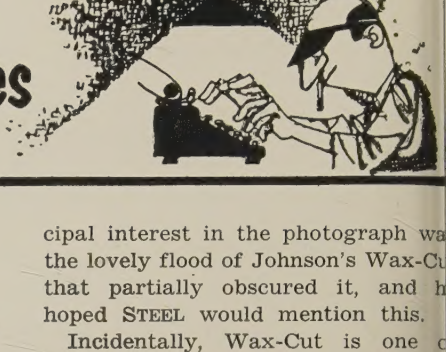
behind the scenes



Full Color for STEEL

You're all familiar with such heart-shaking dramatic stuff as "a song is born," so we think it is only fair to assume that you don't give a hoot how a STEEL story is born. This is most unfortunate because we are employed to reveal what goes on behind the scenes in STEEL (short of material acceptable to *Confidential,* of course), and it is disturbing to address remarks at readers who have already thumbed past Page 6.

The story behind the story of the colored chips, the glowing front cover, and the four-color artwork illustrating methods for improving machining productivity (Page 119) began early this summer at the Monarch Machine Tool Co., Sidney, Ohio. Machine Tool Editor Robert Huber had called on Monarch's Al Albrecht, machining specialist, and while they were shooting the breeze. Bob wanted to know if anything could be learned from the shape of the chips. Al declared that a great deal could be learned from the shape of chips, their color, texture, size.

Three Men Co-operate

Huber and Albrecht went ahead with their experiments. Albrecht set up and photographed in color a whole series of chips. Their shapes were most significant. Huber then visited Dr. W. W. Gilbert, Mfg. Services Dept., General Electric Co., Schenectady, N. Y., and asked him what the colors revealed. Dr. Gilbert set up a machine, cut chips especially for the experiment, and made a set of color transparencies. By this time everybody was excited.

In the home office it was decided that the article should be tailored to management responsible for machining operations and that it should rate a color cover as well as four-color artwork. Huber came across a photo of a machine partly flooded by cutting fluid produced by the Johnson Wax people, so he wrote to Racine, Wis., and asked for the original photograph. R. A. Holmes, manager, industrial sales promotion, S. C. Johnson & Son Inc., kindly obliged. Mr. Holmes pointed out that their principal interest in the photograph was the lovely flood of Johnson's Wax-Cut that partially obscured it, and he hoped STEEL would mention this.

Incidentally, Wax-Cut is one of many lubricants Johnson has developed since 1947, when one of its salesmen stopped at a Brooklyn metalworking shop to investigate its "glue factory" smell. When he found that rancid beef tallow was being used in forming toothpaste tubes out of aluminum slugs, he recommended (and sold) Johnson's first application in metalworking. The liquid worked just dandy, even though it was originally designed to put a fine finish on furniture.

By the time Art Director Bill Kellogg assembled the photographs and copy, summer was in full bloom. Moreover, shortly after Bob Huber wrote the story, he went on vacation, and when Kellogg found he had more type than he had space, he felt surer than ever that he had entered the wrong business.

Printers Back Play

After all the planning, figuring, estimating, and scheduling, the material was turned over to the printers. STEEL had never run four-color process in its editorial pages before, and Carl Schafer, manager of Penton Press, was obliged to spend much of his time soothing and reassuring the editors.

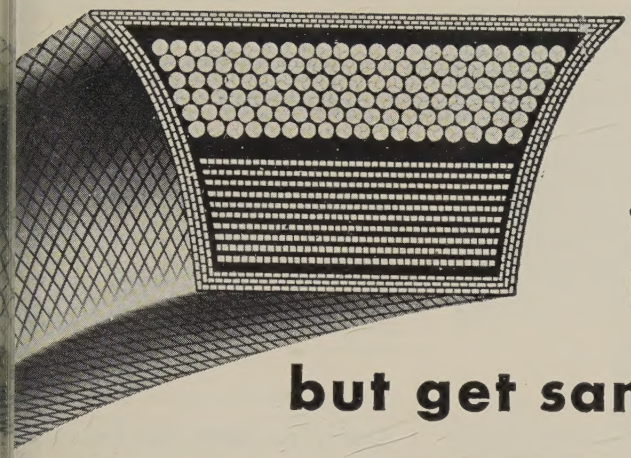
"It's simple," explained the urbane Mr. Schafer, exuding confidence at every pore. "You see, the article will be printed offset by another company, delivered to us in plenty of time, and we will bind it into STEEL. We will print the cover, but after it's varnished, you won't be able to tell it from an original colored photograph."

All this, if you please, simply to describe quickly and accurately how you may improve output from the machining equipment you now have. This is the first of a series in full color. Others (to be announced later) will follow. They will cover various phases of metalworking.

Sherlu

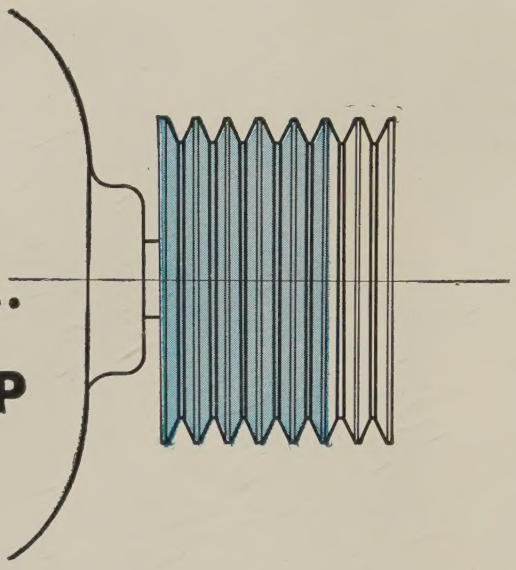
(Metalworking Outlook—Page 73)

5 Gates Super Vulco Ropes do the work of 7 standard V-belts



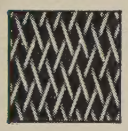
Use fewer belts...

but get same HP



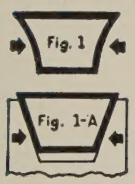
No other V-Belt has ALL these advantages

1. Flex-Weave Cover (U.S. Pat. 2519590)



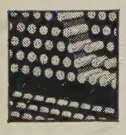
A Gates exclusive: provides greater flexibility with far less stress on fabric. Cover wears longer . . . increases belt life . . . more power available to driven machine.

2. Concave Sidewalls (U.S. Pat. 1813698)



Concave sides (Fig. 1) increase belt life. As belt bends, concave sidewalls become straight, making uniform contact with sheave groove (Fig. 1-A). Uniform contact means less wear on sides of belt . . . far longer belt life.

3. Tough, resilient Tensile Cords



Super strong resilient tensile cords provide 40% greater horsepower capacity . . . easily absorb heavy shock loads . . . reduce number of belts required save weight and space.

4. High Electrical Conductivity

Built into Gates Super Vulco Ropes for safer drives (in explosive atmospheres).

5. Oil, Heat, Weather Resistant

Special rubber compounds make Super Vulco Ropes highly resistant to heat, oil, and prolonged exposure to weather.

Cut sheave width and weight . . . design your drive to benefit from the greater HP capacity of Gates Super Vulco Ropes.

5 Gates Super Vulco Ropes will do the work of 7 Standard V-Belts. A Super Vulco Rope Drive delivers more HP per dollar invested than any standard V-Belt drive.

Sheaves with fewer grooves cost less . . . weigh less . . . occupy less space. Your drive design is improved.

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The Gates Rubber Company

Denver, Colorado

Gates Distributors are in the Yellow Pages

TPA 264

Gates

The Mark of *Specialized* Research

Gates Super VULCO ROPE Drives

LETTERS

(Concluded from Page 10)

manufacturers of home laundry equipment; last year, the number had fallen to 17.

We can list 26, and it may be that we are not aware of one or two small regional manufacturers. This decrease can be attributed more to mergers within the industry than to business failures.

Robert W. Balcom
Associate Director
American Home Laundry
Manufacturers' Association
Chicago

Student Seeks Reprint

I have read your article, "Are Engineers Scarce?" (Sept. 2, Page 98). Being a junior mechanical engineering student at the University of Texas, I am much interested in procuring a copy.

Henry W. Lichte
3900 Wrightwood
Austin, Tex.

Query on Gold Dip Process

In your Technical Outlook of Sept. 2 (Page 129), you refer to a gold dip process called "Atomex." Please give us the name and address of its producer so that we can contact them.

Fred J. Kaim
Superior Plating Inc.
Minneapolis

• *Inquiries should be directed to Harold Robinson, Electrochemist, Baker & Co. Inc., 113 Astor St., Newark 2, N. J.*

Helpful to Personnel Men

Please send a copy of your fine article, "Make Your Labor Pact Work" (Aug. 19, Page 118), which we feel may be helpful.

O. D. McNitt
Personnel Manager
Pottstown Div.
Dana Corp.
Pottstown, Pa.

I would appreciate several copies. It was interesting and to the point.

R. A. Bauer
Personnel Manager
Stearns & Foster Co.
Cincinnati

Article Helps Researcher

Thank you for sending copies of the article, "Aluminum Looks Ahead" (Aug. 19, Page 107). It has been a great help in my current project.

Helen A. Taylor
Assistant to Research Director
D'Arcy Advertising Co.
New York

Original Data on Engineers

We consider your story, "Are Engineers Scarce?" (Sept. 2, Page 98), a fine article which logically presents the hoarding problem. Since it was based partially on our report, *Engineering Manpower*, we request that you mention the report has been published and its price.

George C. Hibbe
Secretary
Engineering Management Reports
Cambridge, Mass.

• *The report,* Engineering Manpower How To Improve Its Productivity, *published by Engineering Management Reports, P.O. Box 161, Cambridge 39 Mass. The price is $18.50 per copy.*

CALENDAR
OF MEETINGS

Oct. 23-25, American Society of Mechanical Engineers: Fall meeting, Hotel Statler, Hartford, Conn. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

Oct. 23-26, Association of Iron & Steel Engineers: Annual convention, Penn Sheraton Hotel, Pittsburgh. Association's address: 1010 Empire Bldg., Pittsburgh 22, Pa. Managing director: T. J. Ess.

Oct. 26-27, American Hot Dip Galvanizers Association Inc.: Semiannual meeting, Netherland-Hilton Hotel, Cincinnati. Association's address: 1806 First National Bank Bldg., Pittsburgh 22, Pa. Secretary: Stuart J. Swensson.

Oct. 29-Oct. 3, National Screw Machine Products Association: Fall membership meeting, Broadmoor Hotel, Colorado Springs, Colo. Association's address: 2860 E. 130th St., Cleveland 20, Ohio. Executive vice president: Orrin B. Werntz.

Oct. 29-Oct. 2, Packaging Machinery Manufacturers Institute: Annual meeting, Cloisters, Sea Island, Ga. Institute's address: 342 Madison Ave., New York 17, N. Y. Executive director: Russell L. Sears.

Oct. 30-Oct. 1, Material Handling Institute Inc.: Joint industry fall meetings, Greenbriar, White Sulphur Springs, W. Va. Institute's address: One Gateway Center, Pittsburgh 22, Pa. Managing director: R. Kennedy Hanson.

Oct. 1-5, Society of Automotive Engineers: Aeronautic meeting, aircraft production forum and aircraft engineering display, Ambassador Hotel, Los Angeles. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Oct. 3-4, Refractories Institute: Fall meeting, Grand Hotel, Point Clear, Ala. Institute's address: 1801 First National Bank Bldg., Pittsburgh 22, Pa. Executive secretary: Avery C. Newton.

Oct. 3-5, Porcelain Enamel Institute: Annual meeting, Greenbriar Hotel, White Sulphur Springs, W. Va. Institute's address: 1145 19th St. N.W., Washington 6, D. C. Secretary: John C. Oliver.

Oct. 4-5, American Ceramic Society Inc.: Refractories Division meeting, Bedford Springs Hotel, Bedford, Pa. Society's address: 4055 N. High St., Columbus, Ohio. Secretary: Charles S. Pearce.

Oct. 6-10, Electrochemical Society Inc.: Fall meeting, Hotel Statler, Buffalo. Society's address: 216 W. 102nd St., New York 25, N. Y. Secretary: Henry B. Linford.

Oct. 6-11, American Trucking Associations Inc.: Annual meeting, Conrad Hilton Hotel, Chicago. Associations' address: 1424 16th St. N. W., Washington 6, D. C. General manager: Ray G. Atherton.

Oct. 7-9, American Society of Lubrication Engineers and American Society of Mechanical Engineers: Joint lubrication conference, Royal York Hotel, Toronto, Ont. Information: 84 E. Randolph St., Chicago 1, Ill. Administrative secretary: William P. Youngclaus.

Oct. 7-9, National Electronics Conference Inc.: Annual meeting and show, Sherman Hotel, Chicago. Conference's address: 84 E. Randolph St., Chicago 1, Ill. Executive secretary: J. S. Powers.

Oct. 7-10, American Institute of Steel Construction Inc.: Annual meeting, Del Coronado Hotel, Coronado, Calif. Institute's address: 101 Park Ave., New York 17, N. Y. Executive vice president: L. Abbett Post.

Oct. 7-11, American Institute of Electrical Engineers: Fall general meeting, Morrison Hotel, Chicago. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

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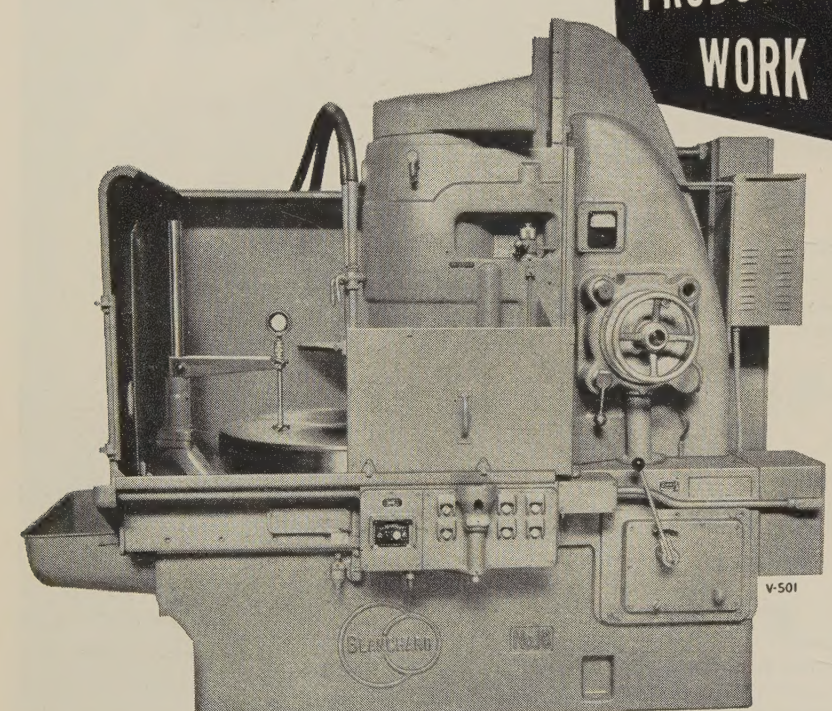
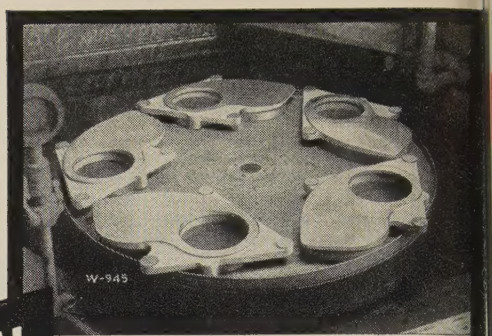
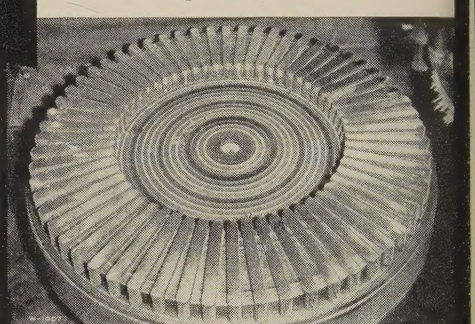
PRODUCTION WORK





SIDE PLATES. 9" x 18" plates ground from rough on No. 18 Blanchard with 36" chuck. Stock removal 1/16" to 1/8" per side. Held flat within .003", parallel to .001", and to dimension tolerance of ±.001". Production: 30 surfaces per hour.



CONNECTING LEVERS. Cast iron levers ground in special magnetic fixture with pins located in "vee's". Stock removal per side is 1/32" to 1/16"; must be flat and at right angles to pins. No. 18 production: 180 pieces per hour, compared to 20 pieces per hour by former method used.

Blanchard Grinders are used throughout industry on surface grinding jobs that demand the utmost in production, finish and accuracy.

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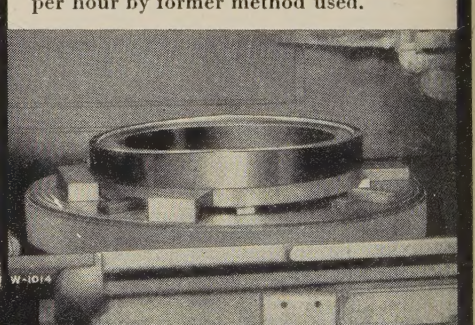
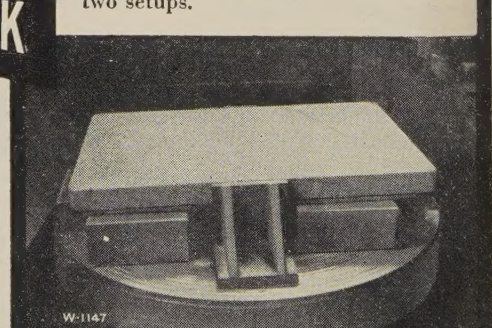


HARDENED STEEL PUNCHES. This 24-13/16" dia. punch, reground on a No. 18, is centered radially on 36" magnetic chuck. Duchate circumferential and radial shear reliefs are generated with two setups.



GRANITE SURFACE PLATES. A No. 18 Blanchard reconditions this 18" x 34" granite surface plate by grinding it flat within .0002". 3/16" of stock is removed in 5 hours.

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Send for free copies of "Work done on the Blanchard", fifth edition, and "The Art of Blanchard Surface Grinding".

THE BLANCHARD MACHINE COMPANY
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Metalworking Outlook

UAW Strike Fund High

The United Auto Workers are building toward a record strike fund to fight for their 1958 demands. The total is now $23 million. It could easily pass the previous peak strike fund of $25 million amassed for the 1955 auto negotiations. A special assessment, such as the $5 monthly levied in 1955, would quickly bring in more than $2 million. That extra levy may be voted next Jan. 22 in Detroit when the union holds a convention to formulate 1958 demands.

Alcan Ends Strike

The four-month strike at Aluminum Co. of Canada's Arvida, Que., reduction facilities ended last week when 6500 workers accepted a three-year wage package that will add 45 cents an hour to their pay. An estimated 120,000 tons of production have already been lost, and more will go down the drain because several weeks will elapse before normal production can be reached. The pact calls for a 26-cent boost the first year, 9 cents in the second, and 10 cents in the third.

New Push for Right-To-Work

The Senate's labor investigations will give a new push to right-to-work laws. Eighteen states now have them, but Indiana is the only one that's extensively industrialized. The National Right-To-Work Committee, headed by former New Jersey Congressman Fred Hartley, expects strong movements against the union shop to develop in Ohio and Kentucky. A referendum on the issue may be held in Idaho whose Senate narrowly defeated the measure early this year. Kansas has a referendum scheduled on the subject for 1958.

Coming: Round 2 in Cutbacks

Round 2 in defense cutbacks may be announced this week. First hint came last week with the Navy's cancellation of the Triton project, a surface-to-surface missile. Some $8 million was to have been spent on it in fiscal 1958, and $24 million has already gone for development. The prime contractors involved: McDonnell Aircraft Corp., St. Louis; Goodyear Aircraft Corp., Akron; and Kearfott Co. Inc., Clifton, N. J. The Navy's Regulus II, competing with the Triton, will be continued. The first round of cutbacks in defense spending hasn't even achieved a $40-billion annual spending rate. The goal is to whittle down to $38 billion.

Aluminum Contracts Revised

General Services Administration and the three major aluminum companies have signed agreements revising the controversial aluminum supply contracts. Aluminum Co. of America, Kaiser Aluminum & Chemical Co., and Reynolds Metals Co. modify the 1950-52 contracts in these four main ways:

1. Producers agree to deduct from their production figures any primary metal purchased from other sources. (Alcoa and Kaiser import primary from Canada; Reynolds doesn't.) 2. Metal delivered to the U. S. shall average 99.6 per cent purity instead of the lower minimum, 99 per cent. 3. Aluminum will now be sold to the government at the price prevailing at the time of production instead of at the time of shipment. 4. The amount of expanded capacity earmarked for nonintegrated users is increased to 35 per cent, from the original 25 per cent. Some 230,000 tons a year will be available to independents. The revisions could save the government as much as $98 million.

New Hope for Farm Tools

Upturn coming for farm equipment makers? The Agriculture Department estimates farmers' realized net income in the third quarter may run as much as $500 million higher than the seasonally adjusted annual rate of $12.1 billion of a year earlier. The improvement is already reflected in some farm equipment makers' sales. International Harvester Co.'s tractor sales for the first nine months of this year are 7.4 per cent ahead of the 1956 pace, and farm implement volume for the third quarter is 21 per cent over what it was in the same period of 1956.

More, but Smaller, Households

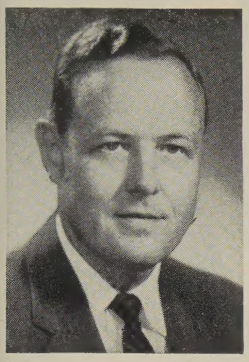
We're forming more households with fewer persons. In 1930, the average household had 4.1 members. Today, it has 3.34. Consumers also are spending more for housing and operation of their households. In 1956, 25.8 per cent of their total expenditures went to maintain their homes, highest in history.

Small Business Ills Studied

What's wrong with small business? In connection with the President's conference on small business, beginning today (Sept. 23) in Washington, three groups were asked to rate the basic troubles of small firms. Executives from large companies put research and development at the top, personnel and finance next. Government leaders said finance was first; personnel and research followed. Small businessmen thought finance led the list; personnel, sales, and research next. All three groups put production problems and government relations at or near the bottom.

Straws in the Wind

Federal Reserve Board's seasonally adjusted production index held at 144 per cent of the 1947-49 average in August, same as in June and July . . . Reynolds' decision to shift its general sales office from Louisville to company headquarters in Richmond, Va., means the end of plans to build a research center and office in the Kentucky city . . . The Senate labor hearings start on the teamsters again tomorrow (Sept. 24) . . . Rumor of the week: More B-52 production cuts are coming.



Are Workers Really Scarce?

We keep hearing so much about the shortage of skilled people at all levels in industry that we are wondering whether we are doing all we can to solve the problem.

Aside from the "learn to do with what you have" programs, constructive advice is noticeable for its absence.

The total work force (both sexes) will increase from 68 million in 1955 to 88.6 million in 1975, or 30 per cent.

But the increase in the vital 25 to 45 male age group will increase only 17 per cent (22.2 million to 26.1 million) in the same 20-year span. From 1955 to 1970, the gain will be only 5 per cent.

At the same time, we will have the expanding needs of a population that will be 30 per cent larger in 1975 than it was in 1955—165 million vs. 221.5 million.

Even with more automation and the technological miracles we can expect to come along in the next few years, we won't be able to realize our industrial potential as a nation unless we can think of more ways to make the best use of our work force.

As a starter, we suggest a critical review of industrial relations policies relating to present employees and the recruitment of new ones. Particularly, look for practices that may be outmoded.

Two merit careful study:

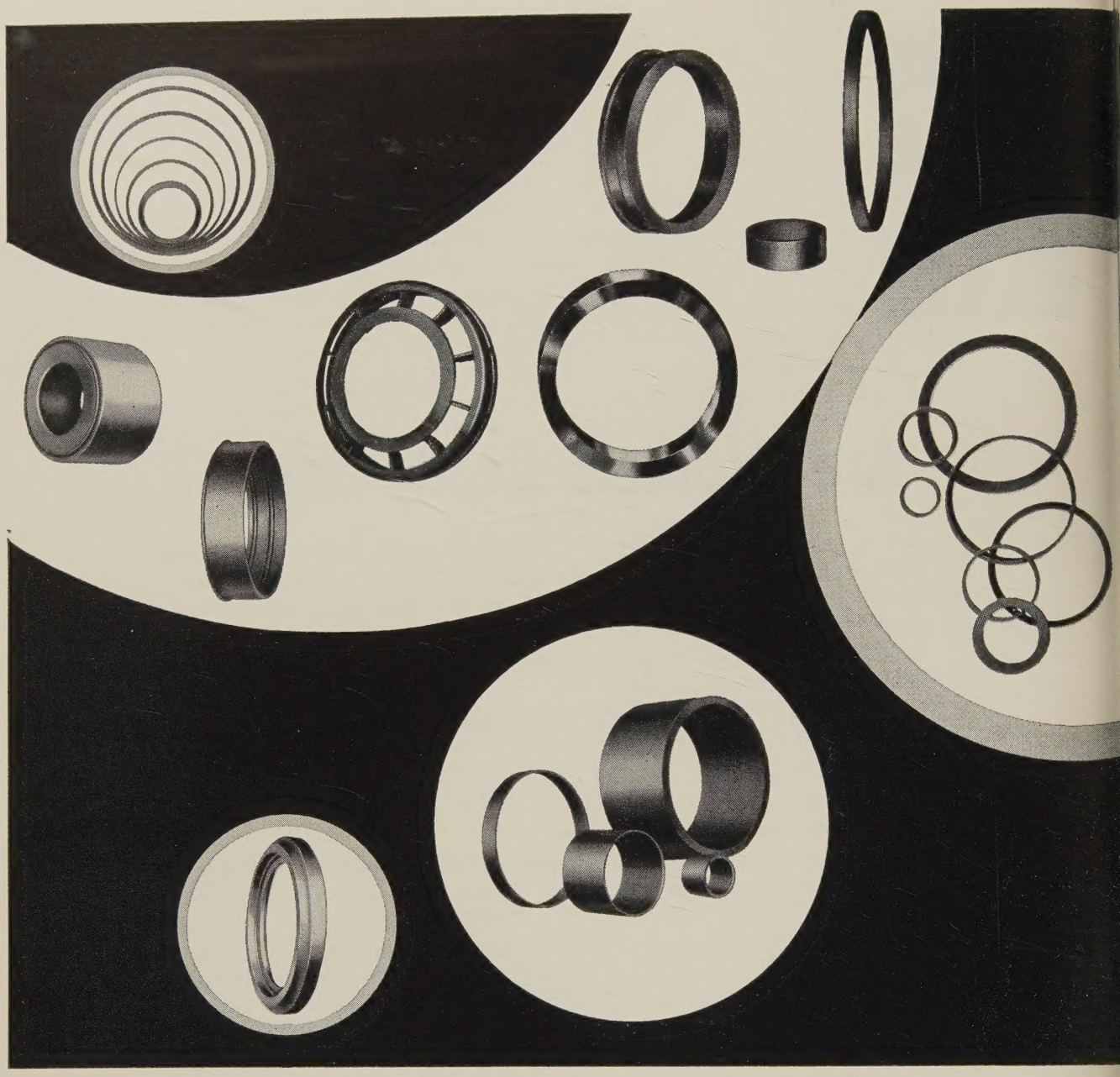
1. Compulsory retirement at 65. (While many people at this age want to and should retire, others still have some of their most productive years ahead of them.)

2. The almost automatic disqualification of job candidates in their forties and fifties, regardless of their experience and knowhow. (Because of changes taking place within many businesses, a number of these people find themselves on the street through no fault of their own.)

Such so-called seniors give us a golden opportunity to alleviate some of the shortage of workers.

Irwin H. Such

EDITOR-IN-CHIEF



IF THE PROBLEM IS CIRCULAR... BRING IT TO CLEVE-WELD

If you now use circular parts that are cast or forged, or if you are planning a new circular component, consider the Cleve-Weld Process for three reasons:

1. We can cut your waste costs up to 30% over bulky cast or forged parts.
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3. We can, consequently, help you speed your over-all production and cut costs further.

Where expensive alloys and "wonder metals" are involved, we may be able to save you enough in waste and machine time to pay for the finished part.

Our proposition is simple. We have 45 years of design, metallurgical and production experience that can probably save you money. To find out, call, or write and send drawings to: Circular Welded Products Department, Cleveland Welding Company, West 117th Street and Berea Road, Cleveland 11, Ohio.

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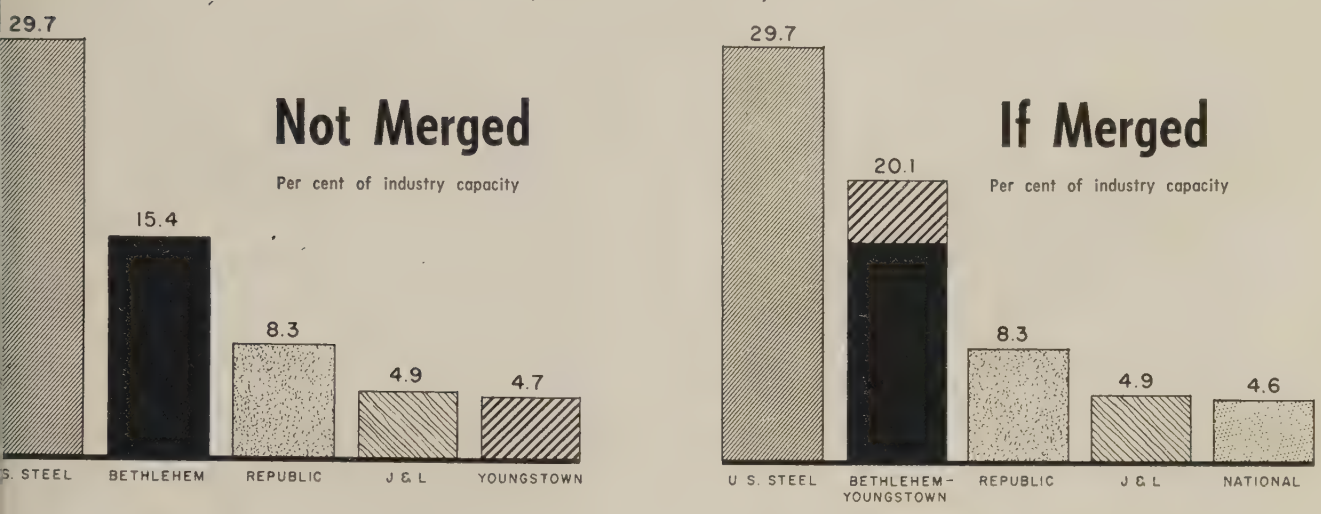
How Merger Would Affect Ingot Capacity Line-Up

(As of Jan. 1, 1957)



We'll Expand, If—Bethlehem

easons why the merger should be permitted are presented y Bethlehem and Youngstown. They'll add 2.6 million ingot ns to capacity if the marriage goes through

ETHLEHEM STEEL Corp. re-aled major expansion plans for oungstown Sheet & Tube Co. ants if the courts allow the two merge. Disclosure came last ek as the two companies gave eir reasons why they should ite.

Arthur B. Homer, Bethlehem's esident, announced that his com-ny will spend $358 million if the erger is consummated to increase e capacity of Youngstown's ants by 2.6 million ingot tons. ost of the money, $268 million, ll be spent at East Chicago, Ind., expand finishing capacity for eared plates, structurals, hot-lled bars, and rolled steel wheels. e remainder will be invested in ditional facilities at Youngstown hot and cold-rolled sheets. The oposed expansion would give thlehem-Youngstown a capacity 29.3 million tons, about 10.3 llion tons less than U. S. Steel rp. has now.

Legal Route—Bethlehem's plans were outlined in affidavits filed Sept. 16 in the U. S. District Court in New York. As defendants in a civil suit brought by the government, Bethlehem and Youngstown were required to answer the Justice Department's motion for summary judgment—a court order barring their merger. In a 103 page affidavit filed June 13, the government sought to prove that consolidation of the companies would violate Section 7 of the Clayton Antitrust Act. Section 7 forbids mergers which would lessen competition or tend to create a monopoly.

Answering papers filed on behalf of the two firms included affidavits by Mr. Homer, C. H. H. Weikel, manager of Bethlehem's department of commercial research and industrial development, and George McCuskey, Youngstown's vice president for finance. They also included affidavits by four economists: Dr. A. D. H. Kaplan of the Brookings Institution; Dr. John P. Miller, professor of economics, Yale University; Dr. Ben W. Lewis, professor of economics, Oberlin College; and Dr. Paul W. Cook Jr., faculty member at the Graduate School of Business Administration, Harvard University.

Reasons for Merger—Summarizing reasons for the merger, Messrs. Homer and McCuskey point out that the industry is under constant pressure to provide enough steel for an expanding economy; that the greatest growth in demand for steel products during the next 20 years will occur in the midcontinent area, in the region which has Chicago as its center; that Bethlehem cannot be a substantial factor in serving that area from its east coast and west coast plants; and that Youngstown lacks the resources to carry out an expansion on the scale required.

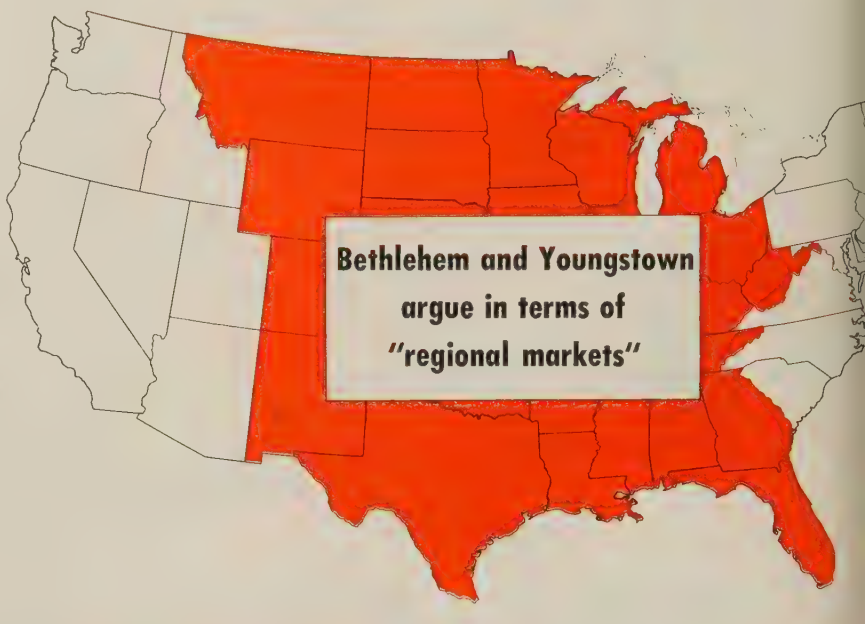
Speaking for the government, Harrison F. Houghton, a Justice Department economist, warns that the merger would make a big business even bigger, increasing Bethlehem's assets from $2.1 billion to $2.7 billion. What's more, he says,

GOVERNMENT'S CASE:

● Justice Department opposition to the merger of Bethlehem and Youngstown is based largely on statistics of national capacity. The government points out, for example, that the merger would raise Bethlehem from third to first in capacity for cold-rolled sheets.

Also, consolidation of the firms would give Bethlehem top capacity for hot and cold-rolled sheets in two important areas—the northeastern states and the Chicago production district. To support its claim that the merger would reduce competition, the government shows that both companies ship the same products to the same states.

U. S. Argues in Terms of "National Markets"



it would raise Bethlehem from third to first in capacity for cold-rolled sheets, increase Bethlehem's position as the company with the nation's largest capacity for concrete reinforcement bars, and make Bethlehem-Youngstown the largest seller of oil field equipment in the U. S. Bethlehem would move from third to first in galvanized pipe, from fourth to first in buttweld pipe, and from fifteenth to seventh in cold finished bars. The merger would increase concentration and tend to create a monopoly, Mr. Houghton concludes.

Market Debate—In defense of the merger, Mr. McCuskey contends that national capacity figures are of little importance in evaluating the competitive position of a firm because there are no national markets for steel products. The high cost of transportation necessarily limits the geographic area in which a particular steel plant can effectively compete, he maintains.

On Common Products—To support his claim that a consolidation of Bethlehem and Youngstown would reduce competition, Mr. Houghton points out that three plants in the same area make similar products. Both the Lackawanna, N. Y., plant of Bethlehem and the Ohio works of Youngstown turn out hot and cold-rolled sheets, hot-rolled bars, cold-finished bars, wire rods, and sheared plates—and presumably sell in the same market. Bethlehem's plant at Johnstown, Pa., produces hot-rolled bars, wire rods, plain wire, and sheared plates.

On State Shipments—Mr. Houghton's figures for shipments of sheets and strip indicate that in 1955 Bethlehem delivered 975,654 net tons to Michigan; in the same year, Youngstown shipped 227,182 tons to that state. Bethlehem's shipments to Ohio were 199,261 tons, while Youngstown's shipments were 573,243 tons.

In 1955, Texas bought 20,959 tons of buttweld pipe from Bethlehem and 34,920 tons from Youngstown. Pennsylvania bought 45,013 tons from Bethlehem and 10,057 tons from Youngstown.

Analyzing this situation, Bethlehem says individual states aren't separate markets. Dr. Miller adds: "In those areas where the two companies now sell common products, the statistical effect of the merger is not large. The sales by at least one of the two companies is in each case a minimal part of its total output, and the combined sales of the two companies is in each case a small part of the total market.

"In all cases, there are several other sources of supply equally well or better situated, the sales of which are much greater than the combined sales of Bethlehem and Youngstown. Moreover, it is Bethlehem's intention to increase its capacity, not to decrease it. In these circumstances it is not apparent how the elimination of one supplier will lead to a restriction of supply, significantly affect the competitive forces in the market or inconvenience customers."

Relation to U. S. Steel—While the government's affidavit dwells at length on the size of Bethlehem and Youngstown and their respective positions in the industry and in selected areas, small attention is paid to a competitive feature of considerable significance—the siz

BETHLEHEM'S CASE:

Arguing that there is no national market for steel products, Bethlehem divides the country into three marketing regions — western, midcontinent, and eastern. Freight rates determine the buyer's choice of a supplier, says Bethlehem. So Youngstown, with plants in midcontinent, and Bethlehem, with plants in the East and the West, compete little.

Concentration figures for districts, such as Chicago plus the northeastern states, are unimportant because that combined area doesn't represent a single market. It's erroneous to assume that competition exists in every instance where the companies ship products of the same class to the same state.

d position of U. S. Steel.

"The position of U. S. Steel in e midcontinent area, where Bethhem will succeed to ownership Youngstown's plants, is much ronger than is indicated by its tionwide position," says C. H. H. eikel. "Ownership by Bethlem of Youngstown's plants in the idcontinent area would not imediately change the relative posion of U. S. Steel, but it would ing into the area another comny having financial and mangerial resources sufficient to enle it to compete effectively. That ould have particular significance the production and sale of avy products such as plates and ructurals, which only U. S. Steel midcontinent now produces in full range of sizes and shapes."

Formal arguments on the Jusce Department motion for a sumary judgment will begin Nov. 4, d it's possible that a decision ll be handed down by December. the government wins, the matr will be carried by the defense the Supreme Court, a move hich would involve at least anher year before a decision.

Eaton Forms Ore Combine

Clevelander sets up international group including Krupp, three other German firms, U. S., and Canadian companies to invest $200 million in northern Quebec

AN INTERNATIONAL combine to develop huge Canadian iron ore deposits at Ungava Bay, Que., is expected to begin operations soon.

Sparked by 73-year-old Cyrus S. Eaton, Cleveland industrialist and financier, the venture was clearing its last hurdles late last week in detailed arrangements with the government of Quebec, owner of the 760 square miles involved.

Krupp Included — Four West German steelmaking firms will share in the operation and will take shipments of ore. Alfried Krupp, head of the Krupp organization, headquartered at Essen, is visiting Canada to participate in discussions concerning the venture. Production is planned to start by 1961.

Other interested German companies are Mannesman Rohrenwerke of Dusseldorf; Hoesch Bergwerk of Dortmund; and Huettenwerkoberhausen of Oberhausen.

Corporations involved in the partnership include Steep Rock Iron Mines Ltd., Premium Iron Ores Ltd., Atlantic Iron Ores Ltd., and International Iron Ores Ltd., all of Canada, and Cleveland-Cliffs Iron Co., Cleveland. Mr. Eaton has an interest in all five.

An estimated $200 million will be invested by the Eaton group to exploit a reserve geologists believe to contain "at least 1.5 billion tons of open pit crude ore." Eaton engineers believe that this 35 per cent ore can be upgraded to 65 per cent by concentration.

Competitive—Ungava Bay is ice-free about 120 days a year, but Rype Island, Greenland, 600 miles to the northwest, is a year-round port.

Eaton engineers expect to make the upgraded Ungava Bay ore competitive with the output from the richer Quebec-Labrador deposits by stockpiling ore at Rype Island during the shipping season. It will be shipped to European markets throughout the year.

Mr. Eaton, born on a Canadian farm, started his career in Cleveland as an errand boy for the late John D. Rockefeller. He has invested frequently in the development of Canada, having organized the exploitation of Steep Rock mine in western Ontario in 1944.

Ore Rush on in Canada

Prospecting is booming in Canada. The modern prospector uses helicopters and airborne magnetometers instead of spade and pan.

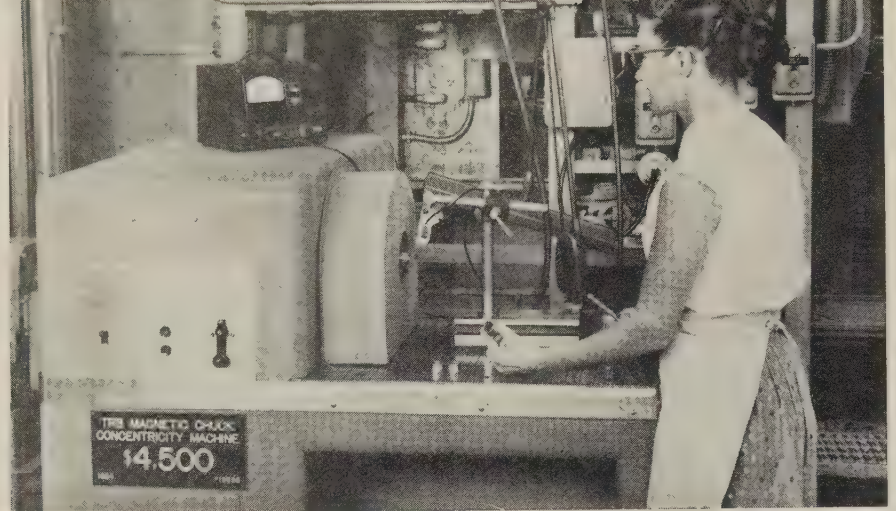
And he is looking for iron, nickel, and copper ores which will be more valuable than gold in meeting the growing demands of an expanding civilization.

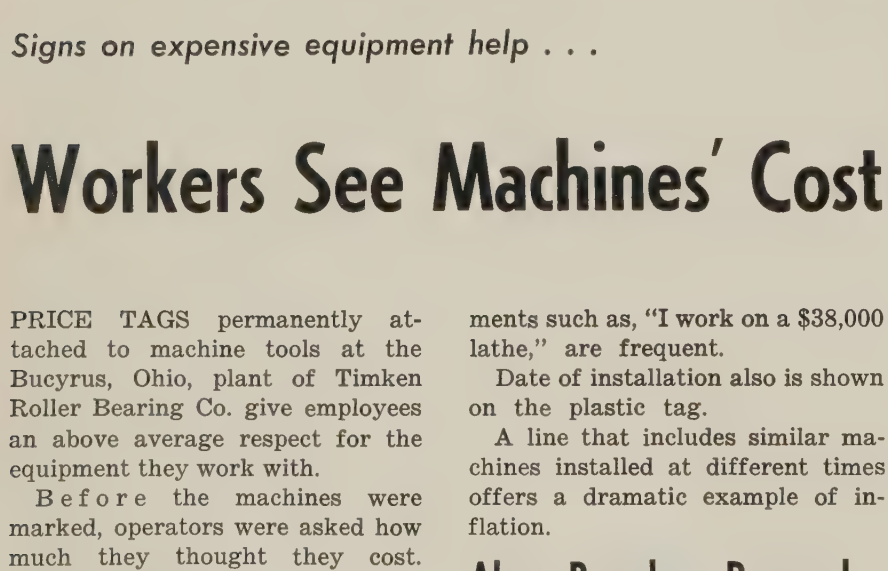
The Ungava Bay area of northern Quebec and Baffin Island, which extends above the Arctic Circle, were scenes of busy activity this summer. In addition to the Eaton group (see above story), Ultra Shawkey Mines Ltd., Toronto, is planning to develop a large iron ore deposit on Baffin Island.

Long Operation—Ultra Shawkey says the field, which preliminary tests show to be 30 to 40 per cent iron, will produce 5 million tons annually for 20 years. An estimated $200 million will be invested.

Oceanic Iron Ore Ltd., a subsidiary of the British Rio Tinto organization, holds claims on 119 square miles in the same area, about 1600 miles north of New York. Diamond drill tests were conducted this summer to determine the feasibility of development.

South of Ungava Bay, near Gerido Lake, other prospectors are conducting extensive explorations for nickel and copper. Near the Wakeham River on Ungava Bay, Asarco Nickel Co. Ltd., subsidiary of American Smelting & Refining Co., is diamond drilling for samples of nickel ore. Some 30 other companies have field crews in the same area.





Signs on expensive equipment help . . .

Workers See Machines' Cost

PRICE TAGS permanently attached to machine tools at the Bucyrus, Ohio, plant of Timken Roller Bearing Co. give employees an above average respect for the equipment they work with.

Before the machines were marked, operators were asked how much they thought they cost. "Well, I wouldn't be surprised if it cost a couple of thousand dollars," was the common estimate for a $25,000 machine. All skepticism disappeared when original invoices were produced.

Employees now have a new feeling of responsibility. Steel hammers are no longer used for adjustments. Maintenance costs have dropped, say Timken officials.

A second result: The employee has more pride in his job. Comments such as, "I work on a $38,000 lathe," are frequent.

Date of installation also is shown on the plastic tag.

A line that includes similar machines installed at different times offers a dramatic example of inflation.

Alcoa Broadens Research

A fundamental research facility to serve the rapidly growing foil and packaging industries has been established at New Kensington, Pa., by Aluminum Co. of America, Pittsburgh. Representing a consolidation and major expansion of the company's research operations in these fields, the new facility will be known as the Foil & Packaging Div. of Alcoa Research Laboratories.

Diecasters Predict

Aluminum part output to hit records in '57, '58, American Die Casting Institute says

A RECORD 192,500 tons of aluminum discastings will be consumed in 1957, predicts the American Die Casting Institute. That's 4.9 per cent more than the 1956 record.

ADCI, at its annual meeting in Chicago last week, also stated that zinc diecastings should equal the 1956 mark of 362,500 tons. Wider use on 1958 automobiles, plus an increase in sales to appliance and business machine makers, is expected to push 1958 sales over the 1957 mark.

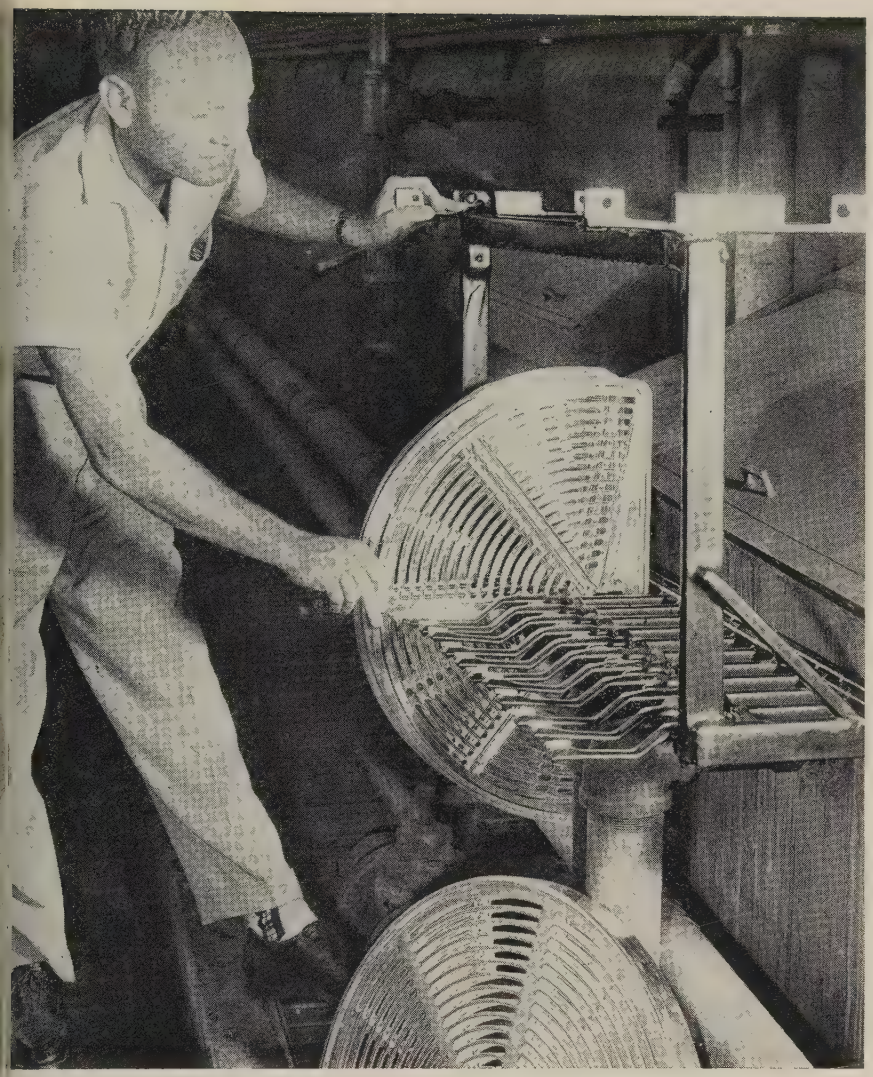
Research—ADCI's Die Casting Research Foundation "shows major progress" in its attempt to economically diecast brass and other high melting point metals.

Representatives of most of ADCI's 122 member companies heard discussions on improved lubricants and lubricators, new temperature control systems, more durable cores, and possible new die materials.

Education — The institute is starting a program at Penn State University to acquaint engineering students with diecasting production and applications. The program includes the contribution of a diecasting machine, two annual scholarships, visual aids, reference books, an on-campus exhibit, field trips, and summer employment in diecasting plants.

Officers—Clifford J. Sheehan, eastern sales manager, Die Casting Div., Aluminum Co. of America, was re-elected president. Clifford L. Anthony, works manager, Hoover Co., North Canton, Ohio, was re-elected vice president. David Laine and W. J. Parker, ADCI, were renamed secretary and treasurer. James N. Smith, chief engineer of diecasting plants, Alcoa, received the annual Doehler Award, the highest honor in diecasting.

Exhibits—ADCI regional groups are planning clinic-exhibits to be shown to diecasting buyers during 1958. They will include die casting displays, finished product assemblies, and special design clinics.



E titanium-tipped anodizing racks, an example of . . .

New Markets for Titanium

WHEN 95 per cent of your sales to one customer, and he jerks s purse strings tighter, you look r new buyers," explains a tita-um producer who is accelerating s search for more civilian uses. Pressure for jet plane and guid- missile requirements boosted ti-nium mill product output from 00 tons in 1955 to 5300 tons in 56. Producers were poised for leap to a predicted 11,000 tons 1957 when the government cut aircraft budget and the Air rce stretched out production ans.

Lower Goal—A spokesman for Republic Steel Corp., Cleveland, says: "We believe total mill shipments for this year will be about 7500 tons. Reason for the slowdown is the government's cutbacks in the military aircraft program. The same amount of titanium is still going into each aircraft engine and airframe, but the number of these units being built is reduced. Demand for titanium definitely has not been cut because of any inadequacies in the metal or any scarcity."

Slower military purchasing puts the spotlight squarely on civilian uses. Says Republic: "Approximately 5 per cent of our production goes into civilian applications." Other producers agree that the civilian portion of the market is 5 per cent or less and will have to be improved.

Hurdles — Two major barriers stand in the way of civilian acceptance—lack of information on possible uses and the premium price. Suppliers think they can jump the second hurdle as soon as they cross the first. "We are looking for and finding applications where a less expensive metal can't do the same job properly," says a sales manager for Mallory-Sharon Titanium Corp., Niles, Ohio.

One such application is underwater. Mallory-Sharon announces: "The largest marine use to date—over 300 lb of pure titanium and alloy parts—will be used in a new 60-ft yacht." The firm expects the boat to prepare the way for many new marine and industrial applications where salt water corrosion is a problem. "Finished weight of titanium parts in the yacht is 312 lb, a weight saving of 43 per cent over metals commonly used," company officials add.

Plenty of Possibilities—As the accompanying table shows, many uses are here already; more are on the way. A spokesman for Rem-Cru Titanium Inc., Midland, Pa., says: "The outlook for commercial applications is steadily brighter. Titanium has proved its industrial worth as a lightweight, corrosion-resistant metal which often costs less than other premium metals because of its longer service life."

In a leading metallurgical application, the material proves its worth on the basis of long service. Titanium Metals Corp. of America, New York, reports that anodizing and electroplating-rack fabricators are selling thousands of titanium-tipped racks. "Titanium price declines allow fabricators to use the metal while holding prices to within 30 per cent of racks using common structural metals," say company officials.

TMCA announces that a General Electric Co. plant uses titanium-tipped racks in anodizing aluminum refrigerator parts. Racks formerly had a service life of only

Titanium Finds Civilian Uses

(Based on information from all mill product suppliers except Firth-Sterling, which is primarily a military supplier.)

INDUSTRY	USES	PLANNED OR POTENTIAL USES
Metal finishing	Electroplating, anodizing racks.	.....
Chemical	Valve trim, pumps, thermowells, heat exchangers, impeller covers, impeller wheels, piping systems, hairpin coils, special types of heater tubes & filter press parts, steam jet ejectors, fasteners.	Valves, tower packing (possibly made of expanded metal).
Food processing	Kettles, storage tanks for tomato, bean sauce.	Catsup strainers, strainer screens for pulping foods.
Pulp & paper	Chlorine dioxide mixer lined with titanium sheets. Some special nozzles & other fittings. Chlorine dioxide feed lines.	Backing wire, wire cloth, division strips on vacuum washers.
Pharmaceutical	Heat exchangers, vessels lined with titanium.	.....
Steam power generation	Turbine blades & other turbine parts, feed water trays.	.....
Electronics	Microminiature tubes, some special uses for foil.	.....
Petroleum	.....	Oil well pumps, seawater distillation units for offshore drilling, valves, pressure vessels.
Marine	Masthead tang assemblies for sailboats, hardware, propeller shafts, cutlass bearings, anchor davits, anchors, rail stanchions, heat exchangers, roof stanchions.	Tank linings for chemical tankers, silencers, heat exchangers, pumps, valves, piping, salt water steam condensers, wire in sailboat rigging.
Automotive	.....	Trim & truck frames, tappets, valves, rocker arms.
Civilian aircraft	Engine parts, jet engine nacelles & pods, airframe structural parts, fasteners.	.....
Ore beneficiation	Impellers, autoclaves, tubing, piping, welding fittings.	.....
Medical	Surgical nails and screws, prosthesis, metal implants.	Crutches & braces.
Photography	Containers handling commercial developing solutions. Shutters for high speed cameras.	.....
Textile	Shuttles, spinnerets.	.....
Railroad	.....	Passenger trains.
Atomic energy	Heat exchangers, reactors, pipe, & tubing.	Valves.

a week to ten days; titanium tips stretched it to over three months. Some racks last eight months without repairs, a company official adds. Success in this application creates a demand for an all-titanium rack.

Uses Multiply — Harvey Aluminum, a division of Harvey Machine Co. Inc., Torrance, Calif., adds more civilian uses, ranging from electronic receiving tubes to equipment for preserving fruit juices. In chemical processing equipment, the firm points out that titanium will resist corrosion from chlorides and hyperchlorides. It will prevent pitting in caldrons containing DDT.

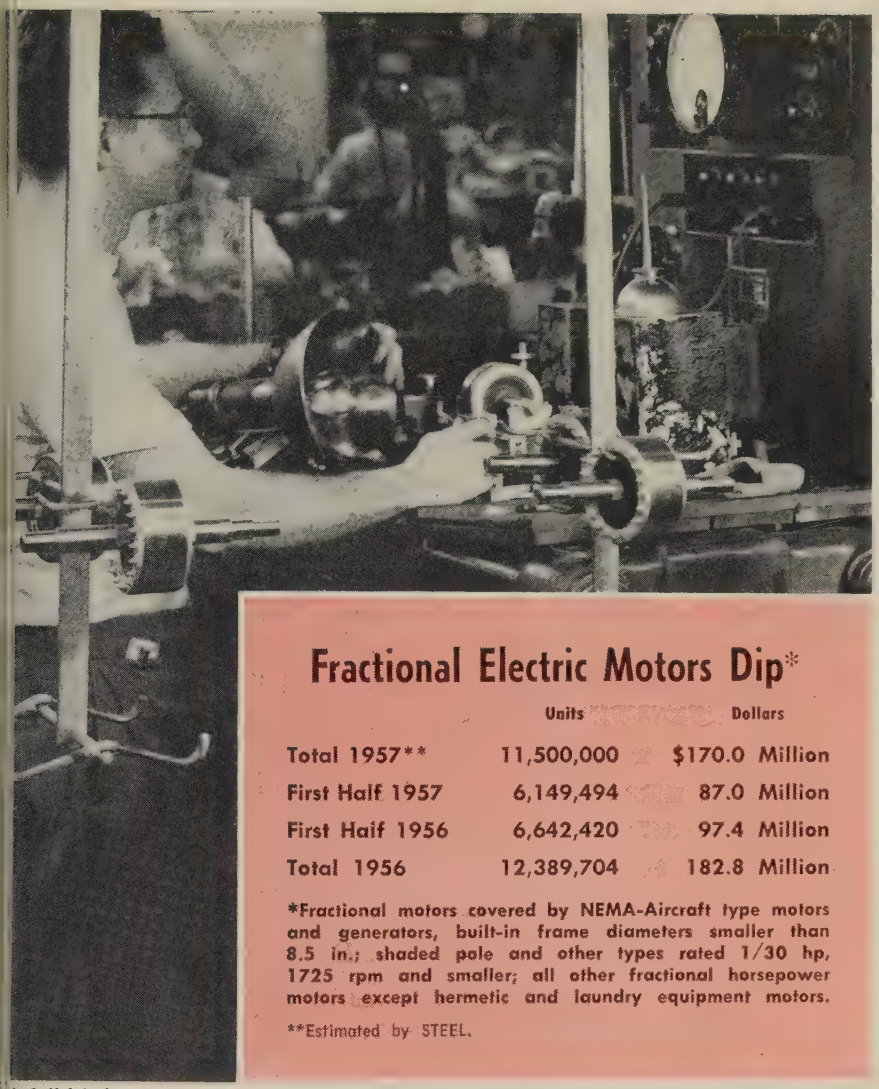
Aiding in the development of new uses is a steadily growing number of firms skilled in fabrication. A Mallory-Sharon spokesman says that more than 100 firms can fabricate mill products. The firm points out that it's not necessary for a plant to make a major change to work with titanium, if the fabricator has experience with stainless steel or other metals. Addition of equipment is not necessary, except for extra fixtures needed in welding.

Growth—Despite the current reductions in demand, several producers are continuing with expansion projects, expecting advances in military requirements for guided missiles and rising civilian demand to make up for declines in military aircraft requirements.

Allied-Kennecott Titanium Corp., New York, has selected a Wilmington, N. C., site for its plant to make forgings and billets. Production will begin late in 1958 or early in 1959. Company officials say the metal's high strength-to-weight ratio at temperatures up to 800° F make it important for commercial aircraft producers. "In aircraft of the future, 75 per cent of airframe weight may be fabricated from titanium," the firm reports.

Harnischfeger Will Build

Harnischfeger Corp., West Milwaukee, Wis., plans to break ground early next spring for a 300,000 sq-ft plant in Dubuque, Iowa. It will make hoists, control equipment, motors, and other electric products.



k & Heintz Inc.

Fractional Electric Motors Dip*

	Units	Dollars
Total 1957**	11,500,000	$170.0 Million
First Half 1957	6,149,494	87.0 Million
First Half 1956	6,642,420	97.4 Million
Total 1956	12,389,704	182.8 Million

*Fractional motors covered by NEMA-Aircraft type motors and generators, built-in frame diameters smaller than 8.5 in.; shaded pole and other types rated 1/30 hp, 1725 rpm and smaller; all other fractional horsepower motors except hermetic and laundry equipment motors.

**Estimated by STEEL.

Fractionals Slow Down

Decreased sales reflect lag in appliance industry; 1957 expected to be 5 to 10 per cent below 1956. Price hike believed likely despite keen competition

SALES of fractional horsepower electric motors are running slightly behind last year's (see table). The industry estimates 1957 will be 5 to 10 per cent under 1956 and expects the current sales level to continue well into 1958.

Big Reason—The appliance industry, one of the largest users of fractional horsepower motors, produced 10 to 15 per cent fewer units the first half of 1957 than it did the first half of 1956 (STEEL, Sept. , p. 63).

"There's just too much fractional motor capacity for the demand," says an executive of a midwest producer. "And competition has become terrific."

Despite competition, which is a definite brake on prices, an increase may come in the next six months.

"A relatively small price increase on many lines of fractional motors seems likely to be necessary in the near future to offset material and labor cost increases during 1957," says a spokesman for General Electric Co.'s Fractional Horsepower Motor Div., Ft. Wayne, Ind.

About 5 per cent is the prediction of James D. Calkins, application engineer, Commercial Motors Dept., Jack & Heintz Inc., Cleveland.

Spiral — "Increased labor and material costs upped prices 5 per cent two years ago and another 7.5 per cent last year," he recalls.

In addition to the appliance industry, producers of pumps, furnace fans, and air conditioners use fractional horsepower motors. The most widely used include alternating and direct current motors, ¼ and ½ hp, 1800 through 3600 rpm; alternating current 1/3 and ¾ hp up to 1725 rpm. Direct current motors are frequently used for variable speeds.

The change to smaller frames has customer acceptance. They like the gain in horsepower as well as the smaller size.

Something New—GE has announced a new line of Form G severe-duty motors (single phase 60 cycle and three phase, 60/50 cycle). Horsepower ratings are 1/6 through ¾ at speeds of 3450, 1725, and 1140 rpm. The line is designed for abnormal operating conditions such as the powering of dairy and food-processing equipment. (The motors are hosed down regularly.) Other applications are in the plating and mining industries.

The motors have totally enclosed, nonventilated construction, stainless steel shafts, and a corrosion resistant finish.

Westinghouse Electric Corp., Sunnyvale, Calif., is producing a motor designed to shake violently. These "rock 'n' roll" units are manufactured for Southwestern Engineering Co., Los Angeles, makers of vibrating screen separators.

Eccentric weights are attached to the shafts to get the shaking, tumbling motion. The motors are made in ¼ and 1 hp.

Anaconda To Replace Mill

Anaconda Wire & Cable Co. broke ground in Orange, Calif., for a 622,000 sq-ft building project which will extend over three years.

Included are a 572,000 sq-ft production facility, a 15,000 sq-ft administration building, and a 35,000 sq-ft boilerhouse. The plant will replace the present west coast mill.

Ike Seeks New Approach to Inflation

A DISCREET announcement by President Eisenhower's new treasury secretary, Robert Anerson, has set off a new chain of events in the administration's fight against inflation. On the surface, Mr. Anderson's statement merely discloses that the heads of several government agencies will discuss ways to stop inflation.

Mr. Anderson, William McC. Martin Jr., Federal Reserve Board head, Dr. Raymond Saulnier, chairman of the President's Council of Economic Advisers, Dr. Gabriel Hauge, special White House assistant to the President on economic affairs, "and sometimes others," will gather behind closed doors to brief the President.

"These meetings," notes Mr. Anderson, "will provide full discussion and interchange of views in connection with whatever is occurring at the time.

"Interchange of views" is the loaded phrase in Mr. Anderson's report because there has been no straight line of policy established on inflation. The administration has at various times (and at the same time), followed these different tactics which directly affect metalworking:

1. Hold down consumer spending (the President's recent advice to the public). 2. Hold down capital spending (FRB's tight money policy). 3. Hold down Defense Department spending (annual $38 billion ceiling). 4. Maintain or increase foreign aid (proposed fiscal 1958 budget). 5. Increase tariffs on goods and raw materials competing with U. S. industries (lead-zinc proposals by Interior Department). 6. Increase social security benefits (part of the administration's long range program). 7. Increase minimum wages (a Labor Department program). 8. Encourage self-sufficiency in our supplies of critical materials (fast tax writeoffs and buying contracts for metals). 9. Maintain corporate taxes. 10. Cut personal taxes.

New Look Will Be Unanimous

Now the President, encouraged by Mr. Anderson discussions among government agencies were originally suggested by him), hopes to get his advisers to agree among themselves, so he may present a concise and workable policy to the public in his January, 1958, State of the Union message.

White House observers believe Ike will get unanimity, even if some heads have to roll. The weakest spot in the administration's armor may be the Council of Economic Advisers, where there remains a good deal of sentiment for New Deal ideas, which, up to this time, has been carefully presented as New Republicanism.

But the chips are down with the Democratic victory in Wisconsin, so look for the administration to play down some of its more "advanced" social philosophy and play up its more "sound" conservatism.

Outlook for 1958: Status Quo

Don't be surprised in January if you hear the President advocate: 1. No tax cuts to be effective in 1958. 2. A $70-billion budget with no provision for increased federal spending for schools, social security, or other "welfare state" concepts. 3. Continued tight money policies. 4. A do-it-yourself attitude for small business. 5. A conservative recommendation to increase tariffs where U. S. firms are affected (which will not be pushed too hard if the House gets its back up as it did with the lead-zinc proposals). 6. A further reduction in defense spending (but not a cut in the missile phase). 7. No help to industry in the form of revised depreciation regulations, tax writeoffs, or government buying of surpluses. 8. No increase in foreign aid.

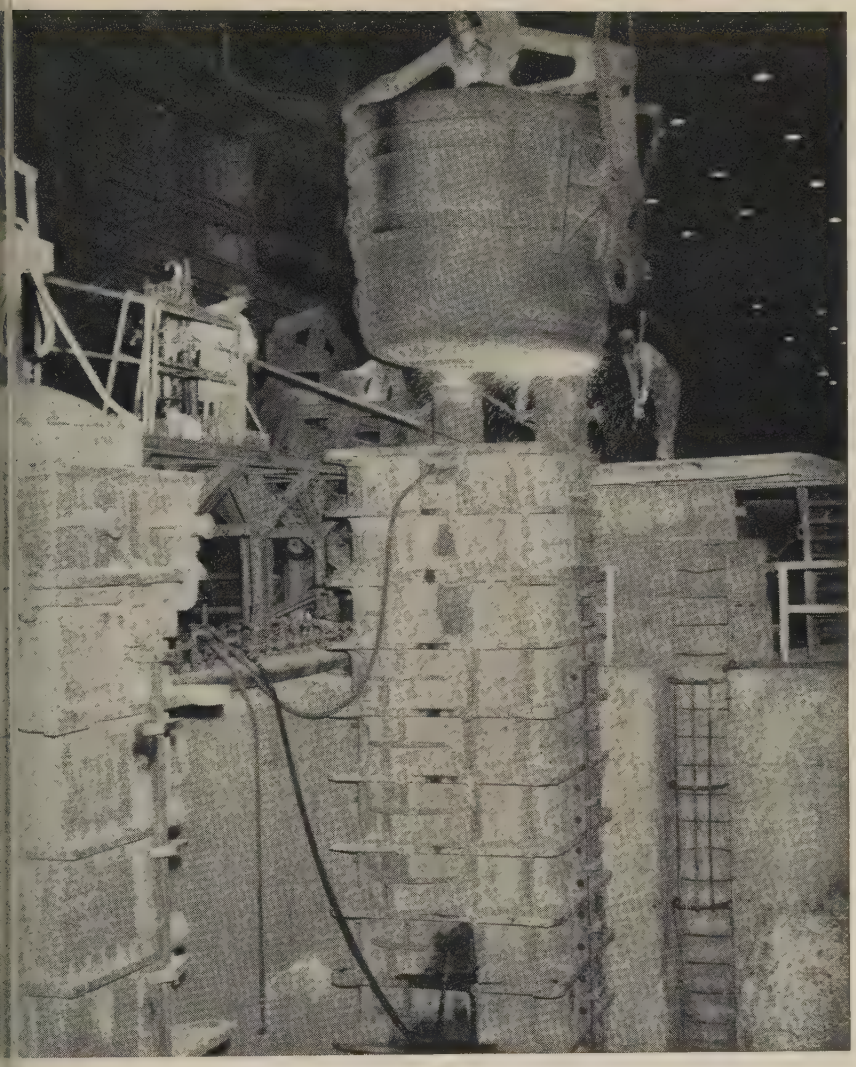
Those recommendations will follow directly from the FRB's new influence on the President's thinking and the Council of Economic Advisers' declining influence.

McElroy To Get Full AF Treatment

Defense Secretary Neil McElroy is off on his first official sightseeing tour of the nation's defense setup. His itinerary: Strategic Air Command, Omaha, Nebr.; Continental Air Defense Command, Colorado Springs, Colo.; Boeing Airplane Co., Seattle; Ramo-Wooldridge Corp., North American Aviation Inc., Lockheed Aircraft Corp., and Douglas Aircraft Co. Inc., all in Los Angeles; Convair Div., General Dynamics Corp., San Diego, Calif., and several atomic installations. Only non-Air Force visit, besides the atomic tours: The Army's Redstone Arsenal, Huntsville, Ala.

First Six Months' Report from SBA

Small Business Administration approved 1936 loans for $89 million in the first six months of 1957, compared with 1600 loans for $70 million in the last half of 1956. Since 1953, the average loan has amounted to $45,770. Government setasides for small firms increased 31 per cent in dollar value during the first half of the year to $399 million.



ring a roll at Ohio Steel Foundry Co., Lima, Ohio

ollmaker Forges Ahead

I a great believer in luck," says h E. Galvin. "The harder I k, the more of it I seem to e."

fter 50 years at the helm of business he helped found, Mr. vin is still working to chart the rse for Ohio Steel Foundry Co., a, Ohio. As chairman and er, he has the final word in all sions affecting his firm, one of nation's largest producers of l rolls.

y Oct. 1, metalworking will see crete evidence of his latest de- on: Footers for a $3.5-million ge plant which may increase o Steel's business by 20 per t.

Expansion—Since 1950, Mr. Galvin has spent $7.4 million for plant additions at Lima and Springfield, Ohio. Unhampered by dividend requirements, he has been able to finance expansion out of earnings. At Lima, his company makes cast steel, cast iron, and forged rolls; at Springfield, steel castings, high alloy corrosion castings, and oil refinery fittings.

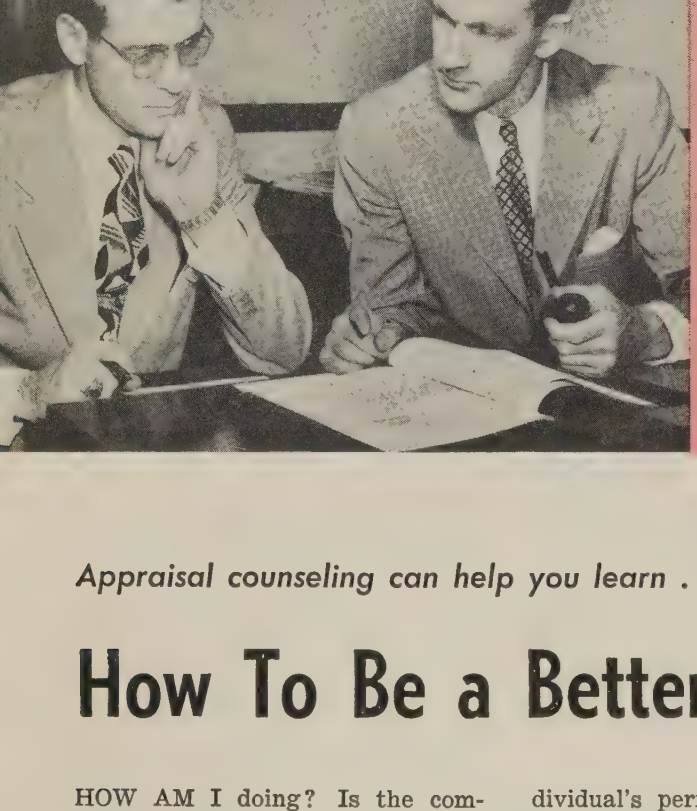
Although it has never forsaken the castings business on which it was established, Ohio Steel has taken many a tack in its search for a favorable wind. Founded at Lima in 1907, it poured its first heats as a supplier to the Lima Locomotive Works, its next door neighbor. In 1913, it began to produce hydraulic castings and in 1917 purchased a Springfield foundry which Mr. Galvin had organized as a personal venture. During World War I, the company made castings for the carriage of a 155-mm gun.

Diversification—With the advent of diesel locomotives and the decline of steam power on railroads, Ohio Steel developed a gasoline power shovel which would require large tonnages of castings. As a step toward market diversification, it also began production of cast steel side frames and bolsters for freight car trucks.

In 1928, the company sold its shovel to Lima Locomotive Works (now Baldwin - Lima - Hamilton Corp.), projecting that firm into the construction equipment business, where it has need for many Ohio Steel castings. In 1928, too, Mr. Galvin's firm began production of oil refinery fittings as a supplier of return bends to Latonia Refining Co., Latonia, Ky. The early thirties brought significant developments at Lima, where first steel rolls and then iron rolls were cast. In 1942, the company answered an army ordnance call for additional breech ring capacity. After proving that rings could be cast as well as forged, Ohio Steel began operation of a new ordnance foundry. By the end of the war, it was producing more than 90 per cent of the rings used on American artillery.

Emphasis on Rolls — Quitting the breech ring business in 1945, the company acquired the ordnance foundry and outfitted it for cast roll production. In 1953, it gave up manufacture of side frames and bolsters for railroad car trucks because of the trade's boom and bust nature.

To strengthen its marketing position, the company in 1954 moved into production of forged work rolls. While it relies on other firms to forge its rolls, Ohio Steel controls their metallurgy and does the machining, heat treating, induction hardening, and testing. Completion of its own forge plant and installation of a vacuum pouring unit, scheduled for the last half of 1958, are the final steps in the company's forged roll expansion program.



Appraisals Shoul

Human Relations . . .

1. How tactful is he with others?
2. How well does he control his emotions?
3. How well does he co-operate with associates?
4. Do his associates and subordinates find him easy to talk to?
5. Does he treat his employees fairly?

Management Ability . . .

1. Does he get and evaluate facts when considering a problem?
2. Does he speak and act for the good of the company?
3. Does he follow through on plans and commitments?
4. Does he delegate responsibility?
5. Does he accept additional responsibility?

Leadership . . .

1. Does he develop subordinates?
2. Does he accept constructive criticism and take corrective action?

Appraisal counseling can help you learn . . .

How To Be a Better Boss

HOW AM I doing? Is the company interested in my progress? How can I improve?

Such questions concern every individual in your first-line supervisory, junior, and middle management levels. Constructive answers should be supplied.

An effective appraisal counseling program will do the job for you. Its communications factor is important, but its other functions are equally valuable:

1. It's a tool to help improve the effectiveness of each individual in his present position.

2. It focuses attention on ways to prepare individuals for greater responsibilities.

3. It'll help insure availability of qualified men to fill vacancies or newly created posts.

4. It'll help the individual to develop his potential.

What Is It?—Appraisal counseling is a periodic review of an individual's performance by his superiors. Superiors, as a panel or team, discuss the individual and his progress within the company—stressing his strengths and weaknesses. The individual and his immediate superior (and sometimes others) talk over the review in private. They determine action the individual and/or the company can take to improve his work.

The panel of appraisers should include the individual's immediate superior and three or four others who work directly with or have knowledge of the individual involved. Leeds & Northrup Co. recommends a team of four—the immediate superior, at least one or two members of a higher management level than the individual, and one or two of his peers.

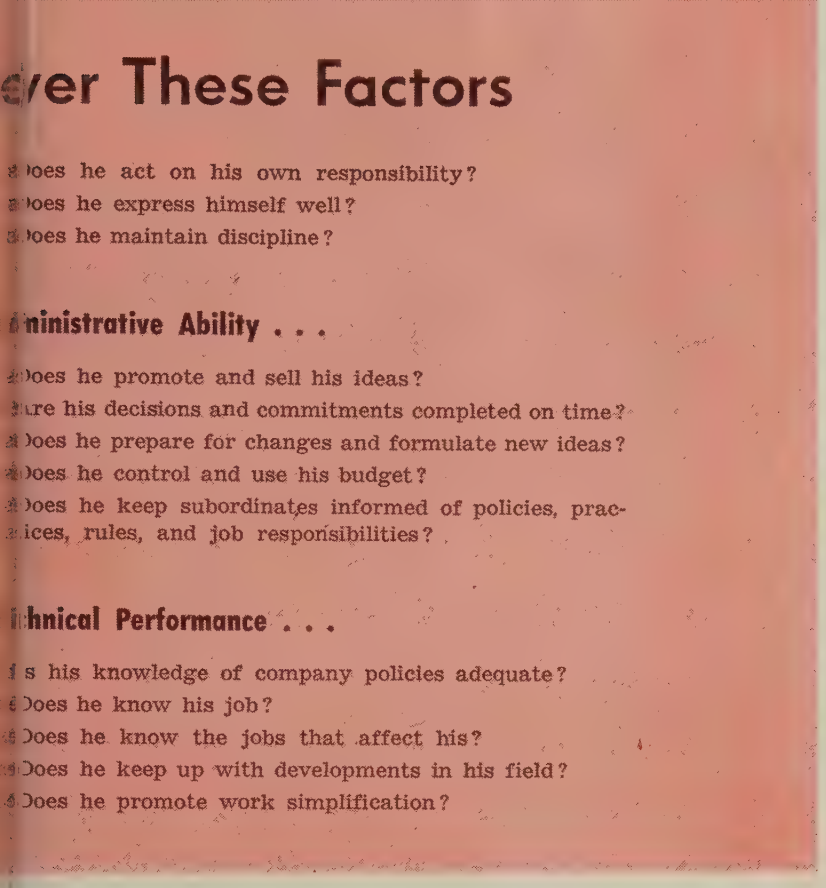
L&N gives the individual the option of selecting one of his appraisers. "This increases his confidence in getting a fair appraisal and strengthens his co-operation in carrying out whatever development action may be suggested," says Edward R. Fiske Jr., in charge of personnel development.

Appraisals can be handled like an informal conference—one man, generally the immediate superior, is chairman and one member is recording secretary.

Most industrial relations executives feel that appraisals should be held once a year.

Guideposts for Success—A successful appraisal session depends upon: 1. Providing the appraisers with a set of factors to be covered so that the discussion is channeled. 2. Maintaining the appropriate atmosphere—the objective is to help the individual to improve. 3. Seeking facts—not gossip—and backing them up with reports, records, and illustrated comments. 4. Requiring all final statements in the appraisal to be the unanimous opinion of the appraisers.

Both Leeds & Northrup and Burroughs Corp. use a detailed guide to conduct the appraisal—(see exhibit). Both reduce the



Source: Burroughs Corp.

praisal itself to specific state-nts about the individual's engths and weaknesses. L&N mmarizes the appraisal under o categories—personal qualifi-ions and performance, including sults achieved and methods used. rroughs uses the five major adings shown in the exhibit.

The Interview — Probably the st important phase is the inter-w involving the individual and s immediate supervisor. Proper mosphere is a necessity. The scussion is not a trial; the pur-se is to inform the individual his progress and give him unsel. Two pitfalls: Don't dis-urage the individual. Don't ise expectations which can't be led.

The superior should be prepared offer suggestions. They often clude such things as guided ading, attendance at special con-rences, night school, visits to her plants, committee assign-ents, job rotation, and special as-gnments.

To stimulate followthrough, Bur-ughs has the counseling su-erior fill out a form following e interview which covers these oints:

1. What are the individual's ambitions within the company?
2. Is he satisfied with his progress?
3. What plans have you made with your subordinate to improve his management competence during the next year?
4. If the employee has indicated that he desires more responsibility, what plans does he have to prepare for it?
5. If you consider the employee suitable for a higher level position, what have you done to help him with his self-improvement plans?

Before submitting a review of appraisals of his subordinates to top management, the superior generally gives the individual one of these over-all ratings:

1. Immediately promotable. 2. Performance completely satisfactory, but employee needs further training before he is promoted. 3. Performance completely satisfactory, but he has no desire for promotion. 4. Performance completely satisfactory, but individual doesn't have capacity for higher promotion. 5. Performance acceptable, but needs improvement to be completely satisfactory. 6. Performance is questionable; employee should be considered for reassignment.

Top management — a review board or panel is recommended—can go over the appraisals to get an idea of how a department is staffed and managed and make specific recommendations for improvement.

An Extra Benefit—Participation is an important part of appraisal counseling. Most individuals appraised also will have the opportunity to appraise others.

Although appraisal counseling can be set up and co-ordinated by a staff function—generally industrial relations—its administration must be line management's responsibility.

To be successful, appraisal counseling must have the blessings of top management. Suggestion: For a starter, ask the brass to test run appraisal sessions, using top level management as subjects. All concerned will get the feel of it.

Expect These Results — Once you've sold the program and experience takes hold, intangible benefits become apparent. The appraisal sessions will produce more than just a rating of the individual. When a superior is discussing the work of one of his subordinates, he is often reflecting his own management practices. One company reports experiences like this one:

A supervisor was rating one of his subordinates low in ability to accept responsibility. Two other appraisers challenged him and asked whether he was creating the proper climate for the individual to accept responsibility. The superior admitted that perhaps he hadn't given the individual the opportunity to show his ability.

Appraisal counseling is not a substitute for an effective management development program. As a supplement, it could form the core of your management development activities because of its communications potential.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*

A giant 250-ton teeming ladle (shown above)
a train of ingot molds at Great Lakes Steel.

Cooling the empty molds with a water sp
(below) gives more uniform cooling rate, ass
return of molds at proper temperature.

How Great Lakes Steel *coats ingot molds* for quality

At Great Lakes Steel, ingot molds get a high-temperature resinous coating by means of America's fastest spinner applicator (see picture above). Rotating at 1,700—2,000 rpm, the applicator applies a more even coating to the molds. In just ten minutes, 28 molds are lined with a highly protective shield for the ingot surface. Repeated before each use, this added step in production helps eliminate defects by repelling splashes of molten metal from the mold walls.

This is only one of the hundreds of methods and operati used by Great Lakes right from the start of steel making maintain the high and uniform quality of its products. T uniform quality can mean real savings to you.

It's easy to get the full story of Great Lakes quality—t dependability, too. Simply pick up your phone and call nearest representative.

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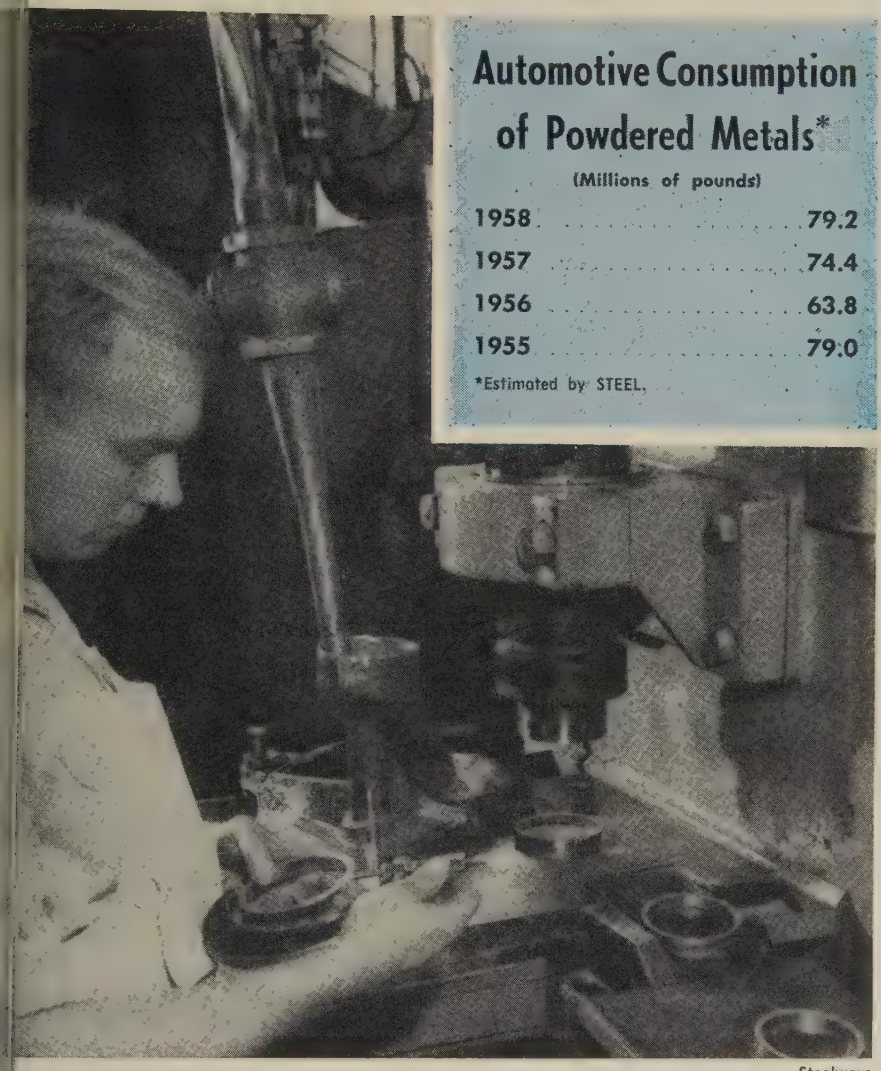


Automotive Consumption of Powdered Metals*

(Millions of pounds)

1958	79.2
1957	74.4
1956	63.8
1955	79.0

*Estimated by STEEL.

Steelways

Powdered Parts Get Bigger

POWDERED METAL consumption is growing at a 3 or 4 per cent annual rate in the auto industry, estimates J. J. Roberts, manager of the powder metal parts division, Allied Products Corp., Detroit.

D. B. Martin, vice president of Chrysler's Amplex Div., point out there are more than 100 applications in '57 and '58 cars. Five years ago, there were between 50 and 75 uses. The average car now contains about 12 lb of powdered metal parts.

Bigger — It's believed that the number of parts won't increase too rapidly in the next few years, but larger and more durable ones will be developed.

Roy Blue, Amplex chief engineer, says the next area of development is apt to be in the use of alloy powders such as nickel chrome. They will give the greater hardness needed in gears, small pistons, and levers which are gaining acceptance in pumps and transmissions.

Parts made from stainless steel powders already are successful. But Mr. Blue indicates that so far there is little automotive demand for powdered aluminum parts.

Future—Mr. Martin thinks brake parts and some types of auto clutches may be made from powdered metals because friction materials can be added easily during manufacture.

Friction clutch plates and parts of some brakes already are being turned out for heavy duty vehicles and certain types of industrial engines.

Past—In 1928, Amplex developed its bronze Oilite (oil impregnated) bearing used for clutch pilot bearings in early transmissions. The bearing it replaced was inaccessible and froze up because it couldn't be lubricated, explains Mr. Martin.

Although all early applications were in bearings, the industry now makes filters, gears, bushings, small valves, and levers.

Long Life — A clutch throw-out bearing made of Oilite withstood 2.5 million declutchings before it failed. The same part made from machined steels conked out after 250,000.

Cheaper — Manufacturing methods are inexpensive.

"This year's cars use ball joint shock absorber pistons which are ten times less expensive than cast pistons and wear ten times longer," explains Mr. Martin.

Competition — Moraine Products Div., Dayton, Ohio., turns out most of GM's requirements.

Ford started making powdered metal parts last year. The industry expects Ford will show the greatest increase in applications in the next few years.

Juggling Act — "We find ourselves competing with stampings, castings, forgings, and extruded parts. A bushing may be made of powdered metal one year and be diecast the next. Cost usually is the deciding factor," says Mr. Blue.

Powedered metal people like to think they can shave prices at least 10 per cent through reduced machining.

The powders are formed in close

tolerance dies and fused in ovens. Powder metallurgists no longer like the term "sintered."

"We can hold tolerances to 0.002 in. with little difficulty," says Mr. Blue.

Example: An oil pump rotor 2.5 in. in diameter, which weighs 2.5 lb, is held to within 0.003 in. tolerance—and that's big for a powdered part.

Buick Chief Predicts Sales

The auto industry will produce and sell about 6 million cars in 1958, estimates Edward T. Ragsdale, Buick's general manager.

This cautious prediction puts Mr. Ragsdale on the low side of industry seers. George Romney, AMC president, earlier made a sales estimate of 6.2 million. Most semiofficial guesses are plugging for 6.5 million car sales.

Mr. Ragsdale has reason to be cautious. In 1956, Buick sold 530,000 cars to take 10 per cent of the market and Mr. Ragsdale predicted 1957 sales would be even better—possibly around 675,000.

Buick will do well to hit the 450,000 sales mark for '57. It's currently accounting for about 6.5 per cent of industry sales.

Mr. Ragsdale figures Buick will get a greater percentage next year, but he doesn't say how much.

Imports — The Buick chief has passed along some plans concerning the German-built Opel cars Buick will start selling next month.

"We will import 1000 Opels a month starting Oct. 1. After three or four months, we'll evaluate dealer reports to see whether the capacity should be increased," explains Mr. Ragsdale.

He figures 4 per cent of 1958 industry sales will be foreign economy cars. Based on a 6 million car year, this means foreign sales of almost a quarter million. About 135,000 economy imports are expected to be sold this year.

New Models — Although details on '58 Buicks won't be released until Oct. 22, Mr. Ragsdale confirms these rumors:

- The cars will be about 2 in. lower; roof and window parting strips are gone. So are the front fender "portholes."
- The division will introduce a luxury series called the Limited.
- Air suspension is available on all models and standard on top two lines.
- Aluminum finned brakes will be used on all but the Special series. The 15-in. wheels are retained.

Other company sources say Buick has spent $100 million on its 1958 model change.

AMC Denies Crisis Talk

George Romney, American Motors president, denies his firm will have difficulty in extending its loans which fall due Sept. 30, 1958.

Says Mr. Romney: "On the basis of indicated operations, I do not anticipate difficulty in securing a renewal of our banking requirements. I already have discussed such a renewal with the banks."

Earlier reports have suggested AMC owed a lending group of 28 banks some $45 million.

Mr. Romney says this is almost the amount borrowed during 1957 ($40.5 million), but subsequent payments have cut the debt to $29.2 million. That's the lowest it has been since the company was formed.

His comments scotch talk that the firm might be pushed into a merger or undergo a shakeup to rid itself of unprofitable operations if loans weren't extended—the suggestion cropped up when it was revealed financier Louis E. Wolfson had bought a majority of AMC stock.

Mr. Romney denies such talk. He still maintains the company will be in the black in fiscal 1958 which begins next month for AMC.

U.S. Auto Output

Passenger Only

	1957	1956
January	642,089	612,078
February	571,098	555,596
March	578,826	575,260
April	549,239	547,619
May	531,365	471,675
June	500,271	430,373
July	495,629	448,876
August	524,854	402,575
8 Mo. Total	4,393,371	4,044,052
September		190,726
October		389,061
November		581,803
December		597,226
Total		5,802,808

Week Ended	1957	1956
Aug. 17	117,589	98,348
Aug. 24	123,130	69,676
Aug. 31	118,563	58,166
Sept. 7	90,704	47,827
Sept. 14	88,844†	63,798
Sept. 21	45,200*	35,652

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Electric Motors: New Look?

Electric motors used to actuate auto accessories should be designed so they can be slipped under car seats and into doors, says Vaughn H. Hardy, chief engineer of GM's Delco Appliance Div., Rochester, N. Y.

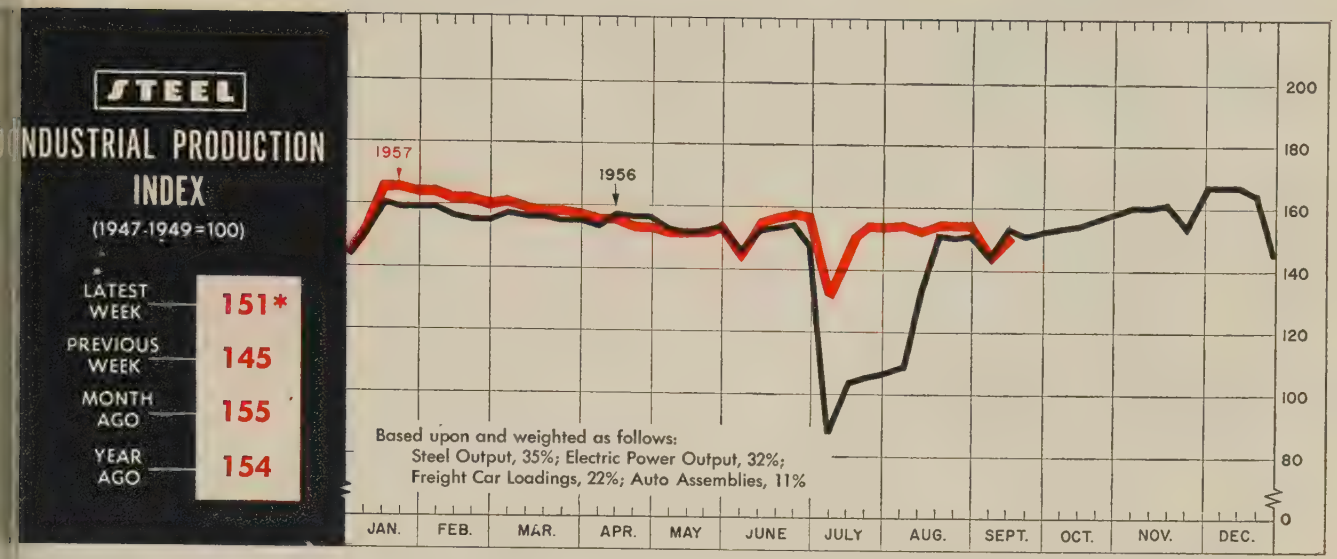
Mr. Hardy, speaking at a meeting of the Society of Automotive Engineers in White Sulphur Springs, W. Va., said: "We feel the motor of the future will no longer be round or even look like a motor."

He adds gearboxes also must be simplified and reduced in cost so electric actuators can compete with hydraulic and air operated units.

If the changes are made, Mr. Hardy feels electricity will be the cheapest way to open car doors and operate fuel pumps, header locks, steering mechanisms, and road speed governors.

Exhaust Notes

- Chevy says it will break ground within a month for its aluminum foundry at Massena, N. Y. The plant will employ 700 and will produce castings for engines and transmissions.
- The average car owner buys a new model at least once every three years, according to findings of the University of Michigan Survey Research Center. Of the families interviewed, 42 per cent buy at least one car every 32 months. Another 14 per cent buy twice, 4 per cent three or more times in that period.
- American Motors has added 421 dealers in the first eight months of this year, 70 of them in August. The firm is expecting the Rambler to spark a comeback in 1958. Its imported Metropolitan has sold 78.5 per cent more units than it did in 1956.



*Week ended Sept. 14.

Industry Is Setting Records in 1957

THIS YEAR may not be everything that everybody expected of it but in many respects it will go down to the record books as the best year in our history. It has been characterized as a year of "rolling adjustment" or "high level production." The net result may not be as spectacular as in the last two years, but it sets a new standard to shoot at in 1958.

Production — STEEL's industrial production index (above) has been above the year-ago level with only a few exceptions. During the fourth quarter, it will just about equal 1956's corresponding period, which will result in a weekly average of about 156 for this year, compared with 150 last year. The Federal Reserve Board's production index also will set a record monthly average this year. While it may fall short of the record 147 (1947-49=100) set last December, it will still be strong enough to rack up a monthly average of 146 for the year, compared with last year's 143.

GNP — Gross national product will set records for both dollar and physical volume this year. The first half witnessed an annual rate of about $432 billion, and the addition of a $435 billion third quarter and a $437 billion fourth quarter will put the yearend total between $434 billion and $435 billion. That is an increase of 4.3 per cent over $414.7 billion in 1956.

Prices—Wholesale prices, stimulated by the pass-on of material price hikes and wage increases, will advance steadily to a new high of 120 (1947-49=100) by the end of the year. Consumer prices will take a similar course and end up at about 122 (1947-49=100) by next Jan. 1. Bigger price tags on new autos and appliances will contribute heavily to this.

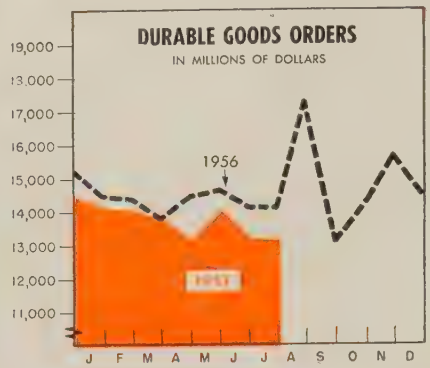
Durable Goods — Despite some weakening in new orders, durable goods will wind up this year with an advantage over last year. Monthly shipments have been con-

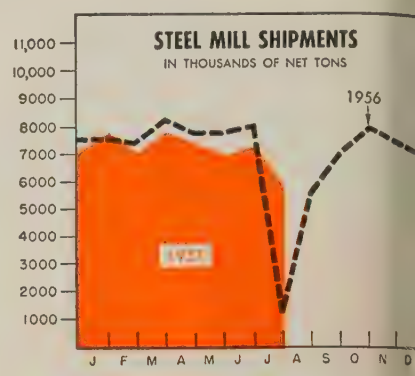
BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,076[1]	2,097	2,477
Electric Power Distributed (million kw-hr)	12,100[1]	11,678	11,339
Bituminous Coal Output (1000 tons)	8,845[1]	9,990	8,730
Petroleum Production (daily avg—1000 bbl)	6,750[1]	6,807	7,049
Construction Volume (*ENR*—millions)	$262.0	$314.1	$372.5
Auto, Truck Output, U. S., Canada (*Ward's*)	109,134[1]	110,839	86,186
TRADE			
Freight Car Loadings (1000 cars)	745[1]	648	821
Business Failures (Dun & Bradstreet)	208	262	196
Currency in Circulation (millions)[3]	$31,256	$31,145	$30,910
Dept. Store Sales (changes from year ago)[3]	+2%	+5%	+4%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$20,417	$18,191	$19,287
Federal Gross Debt (billions)	$273.5	$273.8	$275.4
Bond Volume, NYSE (millions)	$17.0	$12.6	$21.5
Stocks Sales, NYSE (thousands of shares)	9,051	5,479	9,835
Loans and Investments (billions)[4]	$86.3	$86.5	$85.7
U. S. Govt. Obligations Held (billions)[4]	$24.8	$24.9	$26.5
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	225.71
STEEL's Nonferrous Metal Price Index[6]	209.6	209.3	266.1
All Commodities[7]	118.1	118.3	115.1
Commodities Other Than Farm & Foods[7]	125.8	125.9	122.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1957, 2,559,490; 1956, 2,461,893. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

THE BUSINESS TREND





	New Orders*		Sales*	
	1957	1956	1957	1956
Jan.	14.176	14.449	14.941	13.832
Feb.	14.102	14.374	14.808	13.824
Mar.	13.853	13.771	14.198	13.252
Apr.	13.234	14.468	14.254	13.723
May	14.115	14.654	14.296	13.570
June	14.249	14.093	14.207	13.587
July	13.069†	14.087	14.642†	13.021
Aug.	.....	17.342	.....	13.723
Sept.	.....	13.042	.....	13.449
Oct.	.....	14.312	.....	14.393
Nov.	.....	15.776	.....	14.249
Dec.	.....	14.543	.....	14,526

*Seasonally adjusted. †Preliminary.
U. S. Office of Business Economics.

	Net Tons		
	1957	1956	1955
Jan.	7,809,451	7,587,870	6,009,95
Feb.	7,066,732	7,468,393	6,119,90
Mar.	7,821,616	8,255,824	7,268,79
Apr.	7,349,752	7,783,873	7,279,32
May	6,972,091	7,764,776	7,540,88
June	7,284,616	8,077,805	7,770,21
July	5,877,133	1,288,988	6,250,59
Aug.	.....	5,539,915	7,053,61
Sept.	.....	7,058,028	7,378,24
Oct.	.....	7,930,957	7,216,82
Nov.	.....	7,431,136	7,247,99
Dec.	.....	7,064,093	7,580,94

American Iron & Steel Institute.

sistently above the year-ago marks, even when price boosts are taken into account (see table, above). This situation will persist, even though orders continue to slip under shipments, because of the huge backlogs for durable goods. On Aug. 1, unfilled orders were $56.3 billion, good enough for about four months' business at current rates.

Capital outlays for plant and equipment are peaking out this quarter, says the Commerce Department, and will level off during the remainder of the year. The total for the year will end up between $37 billion and $37.4 billion, well ahead of last year's record $35.08 billion.

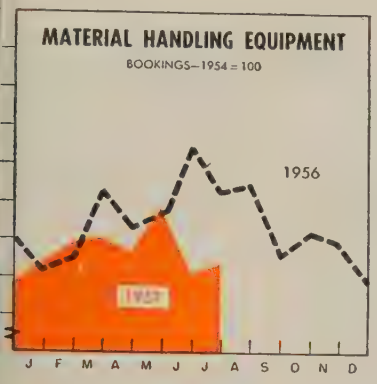
Other durable goods forecasts for 1957: Machine tool shipments, $900 million; railroad car shipments, 99,000 plus; agricultural machinery sales, 10 to 15 per cent over 1956's; appliances production, 10 to 15 per cent under 1956's (see STEEL, Sept. 9, pp. 63-65); metalworking sales, $138 billion.

Construction—Construction again will be one of the chief supports of the national economy, totaling $46.8 billion, compared with last year's $46.1 billion. While dollar volume will be up, physical volume will be down. The highway program did not materialize according to earlier predictions, and residential construction is significantly below year-ago levels. The year-to-year decrease in contract awards will not greatly affect construction put in place until sometime in 1958.

Business Community — Business failures this year will probably set a record of around 13,400. At the same time, new incorporations will slip from 140,775 last year to around 134,000 this year. But the business community will continue to grow, making a net addition in 1957 of about 50,000 firms. Total by Jan. 1: 4,350,000 active business firms.

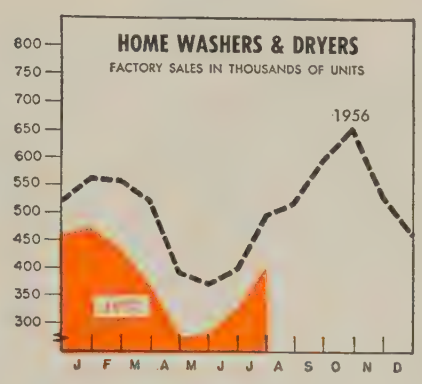
Automobiles — For the third straight year, early estimates of production will prove out of line. In 1955, automen underestimated America's auto appetite; in 1956, they overestimated; they repeated again this year. Final calendar-year figure will be close to 6.2 million for the third best year in history, but well under the 6.5 million anticipated a year ago.

Steel—An uptrend in orders for fourth quarter delivery may help the industry to topple the 1955 record of 117 million tons. It may be some time before the industry



	1957	1956	1955	1954
Jan.	126.34	122.43	97.00	93.56
Feb.	139.29	129.56	98.71	96.45
Mar.	140.76	166.14	149.16	115.55
Apr.	132.67	145.20	109.52	122.76
May	157.95	155.53	110.50	98.54
June	121.57	189.13	139.00	112.42
July	128.31	165.50	111.76	91.68
Aug.	.....	168.70	106.20	94.06
Sept.	.....	130.35	136.80	88.43
Oct.	.....	143.38	123.52	95.41
Nov.	.....	138.50	118.09	88.66
Dec.	.....	117.76	139.85	102.49
Avg.	.....	147.68	120.01	100.00

Material Handling Institute Inc.



	Washers		Dryers	
	1957	1956	1957	1956
Jan.	331,314	393,717	144,621	166,243
Feb.	319,580	405,631	114,517	148,522
Mar.	286,205	405,744	83,668	113,031
Apr.	230,675	324,238	42,850	64,923
May	254,195	315,249	31,572	55,330
June	282,289	340,235	46,783	58,441
July	335,139	380,172	70,011	117,548
Aug.	.....	373,925	.....	144,537
Sept.	.....	402,631	.....	192,724
Oct.	.....	449,409	.....	206,929
Nov.	.....	357,935	.....	170,529
Dec.	.....	298,368	.....	162,953
Totals		4,447,254		1,601,710

American Home Laundry Mfrs. Assn.

has to operate at the unusually high rates of the last couple of years because capacity is high enough to meet almost any exigency (see STEEL, Sept. 16, pp. 79-81).

Inventories — Manufacturers will add about $5 billion to their inventories this year, which is considerably beneath the $5.5 billion to $6 billion added in 1956. Physical volume will be off even more because of price increases.

Population—Each month, the nation's population growth is equivalent to a city about one-third the size of Cleveland. On July 1, the total reached 171,229,000, about 1 million ahead of where the government thought it would be when the last long range forecast was made. Of equal significance is the fact that over the past year personal income has increased at an annual rate of 6.3 per cent. This means greater buying power for more people, which spells continued high demand from industry.

Trends Fore and Aft

• Sales of television receivers by Motorola Inc., Chicago, rose to a new high in August, reports Edward R. Taylor, executive vice president. He also says that sales of high fidelity phonographs doubled in 1956 over 1955 and anticipates that sales will continue the sharp gains of recent years and more than double the 1956 volume.

• Private housing starts climbed sharply in August to an annual rate of 1,010,000 units, reports the Labor Department. This was the best effort so far in 1957.

• "Total shipments for the eight-month period ended Aug. 31 were at a satisfactory level," reports Arthur Lehr, president of Bliss & Laughlin Inc., Chicago. "Incoming orders during the last few weeks give us indication of a heathier picture for the fourth quarter," he adds.

• Wholesale prices continued their upward trend in August, reaching a record of 118.3 (1947-49 = 100), according to the Bureau of Labor Statistics. A rise in all commodities other than farm and foods contributed greatly to the 0.1 point increase from July.

• Commercial and industrial loans to manufacturers of metals and metal products continue to dip. From June 26 to Sept. 4, the cumulative decline was $415 million, compared with $219 million in '56.

The next one will be "just like the first one" from this Heppenstall Die Block.
Die block dimensions: 13'2" x 2'7" x 1'4"
Weight before sinking: 23,830 pounds

Heppenstall Die Blocks reduce sinking time . . . hold close tolerances for these 3500 lb. crankshafts

Reports from Park Drop Forge Company, Cleveland, point out two important performance benefits resulting from the Heppenstall Die Blocks used for this diesel crankshaft job. First, the machinability of Heppenstall's Hardtem Die Steel made it possible to sink the impression in a minimum of costly machining time. In addition, Hardtem's outstanding ability to hold dimensions under the hammer enabled the company to turn out close tolerance forgings throughout the entire production run. Since 1937, when the diesel trend began, the majority of locomotive crankshafts have been Park Drop forgings . . . and most of them from Heppenstall Die Blocks.

Forged on all six faces from special Heppenstall Steel, Hardtem and other Heppenstall Die Steels are manufactured in a wide range of hardnesses to match varying customer requirements of application and machinability. Veteran Die Sinkers know they can select a Heppenstall Die Steel that can be machined to greatest accuracy in minimum cutting time, yet will hold dimensions for maximum production runs. If you're looking for the best possible combination of die block machinability and service life, contact your Heppenstall Representative. He can help you quickly select the one best answer.

These five Heppenstall Warehouses carry stocks of the most popular size die blocks:

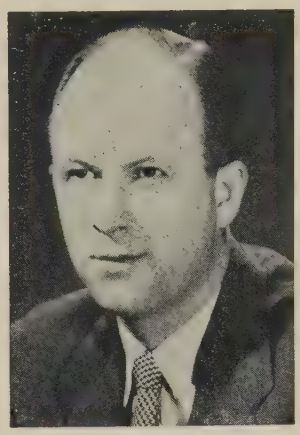
Bridgeport 5, Conn. • Detroit 32, Mich. • Indianapolis 27, Ind. • Los Angeles 22, Calif. • Pittsburgh 1, Pa.

HEPPENSTALL
... the most dependable name in die blocks
PITTSBURGH 1, PENNSYLVANIA

RICHARD K. DICKSON
n. mgr. Trent Tube plant

ALBERT H. CLARKE
Crouse-Hinds mfg. v. p.

ROBERT K. STERN
Mid-Century Instrumatic pres.



ROBERT L. GRUNEWALD
GE gas turbine mfg.-mgr.

hard K. Dickson was made gen- l manager of **Trent Tube Co.'s** v plant at Fullerton, Calif., ich will operate as a division of main plant in East Troy, Wis. l. Dickson was chief metallurgist Trent Tube, subsidiary of Cru- le Steel Co. of America.

ert H. Clarke was promoted to e president - manufacturing at **use-Hinds Co.**, Syracuse, N. Y. is succeeded as vice president- gineering by **Russell P. Northup,** mer vice president for Condulet es. **John B. Crosby,** assistant the president, succeeds Mr. rthup. **William A. McAuley** was de new products manager in the les division.

illiam H. Ashton was made direc- of raw materials in the office the vice president of **American eel & Wire Div.,** U. S. Steel Corp., eveland. He succeeds **Jacob W.** x, made general superintendent the Duluth Works.

ank D. Brittain was elected vice esident-sales for all diecasting erations of **Hoover Ball & Bear- g Co.,** Ann Arbor, Mich.

ational Supply Co.'s **Spang-How- duct Div.,** Melrose Park, Ill., med **Raymond W. Clifton** plant anager; **Leo Rapp,** purchasing gent.

seph W. Rath was made superin- ndent; **T. A. Thompson,** assistant perintendent in the open hearth epartment of **Weirton Steel Co.** iv., National Steel Corp., Weirton, . Va.

Robert K. Stern was elected president, **Mid-Century Instrumatic Corp.,** New York. He was vice president and general manager of Fischer & Porter Co.'s data reduction and automation division.

American Manganese Steel Div., American Brake Shoe Co., Chicago, elected **Joseph L. Mullin** executive vice president. He was vice president of the division. **W. Frank Kelly** was made vice president-operations; **John E. Holtman,** assistant vice president-operations; **William E. Crocombe Jr.,** assistant vice president-sales.

Super Tool Div., Van Norman Industries, Detroit, promoted **Milton J. Steffes** from vice president-sales and engineering to vice president and works manager. **Lawrence A. McDonald** was made sales manager.

Marion Power Shovel Co., Marion, Ohio, named **Merle V. Lashey** manager of engineering; **Jack F. Weis,** assistant chief engineer for large and intermediate size machines; **Robert W. Bergmann,** electrical engineer.

Ralph R. Moore was appointed manager of **Curtiss-Wright Corp.'s** Buffalo extrusion plant. **Moncrieff H. Galloway** was named production control manager, metals processing division, Buffalo.

At the Ft. Madison, Iowa, division of **Anchor Metals Inc., Wallace J. Anderson** was made executive manager; **Darrell W. McLemore,** production manager.

Robert L. Grunewald was made manager-manufacturing for **General Electric Co.'s** gas turbine department, Schnectady, N. Y. He was manager, component manufacturing and engine rebuild-production engine department, at Evendale, Ohio.

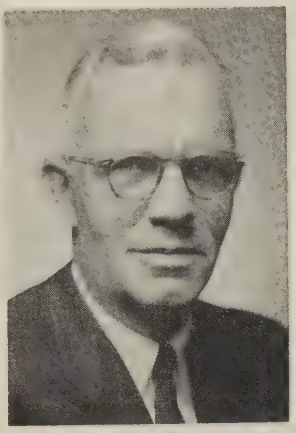
Caterpillar Tractor Co., Peoria, Ill., reorganized its manufacturing general office into three departments: Administrating the departments is **L. J. Ely,** named director of manufacturing. **Hugh Boggs** was named manager of planning and plant engineering; **Roy McCluskey,** manager of production control; **Dale Wright,** manager of quality control.

P. H. Spennetta joined **J. I. Case Co.,** Racine Wis., as director of engineering, industrial division. He succeeds **T. A. Haller,** named to head a newly established research and development center in Racine. Mr. Spennetta was formerly chief of research and testing for Caterpillar Tractor Co.

Robert A. Atkins was named manager of the newly created product development and sales research for **Sharon Steel Corp.,** Sharon, Pa., a department which will add new products, including alloys for the ballistic, aviation, and atomic energy fields.

D. L. Douglass, manager of parts and service of **Thew Shovel Co.,** Lorain, Ohio, was promoted to director of parts and service. **Carrol G. Turk** was made assistant to Mr. Douglass. **R. G. Thibaut** continues

LESTER E. BRION JR.



JOHN D. DRUMMOND

Peter A. Frasse administrative changes

DONALD K. BALLMAN

WILLIAM R. DIXON

Dow Chemical sales positions

as manager of the service department.

Peter A. Frasse & Co. Inc., New York, elected **Lester E. Brion Jr.** executive vice president; **John D. Drummond**, vice president-general manager of sales and warehouse operations. **N. Leroy Hammond Jr.** was made Philadelphia district manager.

Alan W. Smythe, vice president and general manager, **Thew Shovel Co.**, Lorain, Ohio, was elected president of **Byers Machine Inc.**, Ravenna, Ohio, subsidiary. He continues in his present capacities at Thew. **W. J. Allaback** was made vice president of Byers and also director of operations for Thew. **H. G. Dehnel** was made manager of Byers. **W. W. Blauvelt**, its former general manager, resigned that post to become director of business planning and control division of Thew, continuing as Byers' vice president.

Arvid Nihlen was made engineer of manufacture, **Griscom - Russell Co.**, Massillon, Ohio, subsidiary of General Precision Equipment Corp.

Robert Bevis was made assistant sales manager, domestic sales, **Cincinnati Milling Machine Co.**, Cincinnati.

Edward F. Kurzinski joined **Air Products Inc.**, Allentown, Pa., as manager of sales development engineering. He was laboratory division head at Linde Co.

Newton H. Willis, a vice president, was placed in charge of engineering at **Waukesha Motor Co.**, Waukesha, Wis. He continues to direct the railway division.

Donald K. Ballman, general sales manager, **Dow Chemical Co.**, Midland, Mich., was promoted to director of sales to succeed **Donald Williams**, now director of corporate relations. **William R. Dixon** was made general sales manager.

Howard H. Nichols was made sales manager, **Hazen Engineering Co.**, Pittsburgh. He was with Columbia-Geneva Div., U. S. Steel Corp.

James K. Nunan fills the new post of vice president-electronics, **Clevite Corp.**, Cleveland. He was general manager, Clevite Research Center.

Clifford A. Bussee was made engineering manager, electronics division, **Rheem Mfg. Co.**, Downey, Calif.

Clowes M. Christie was elected president, **Dayton Rubber Co.**, Dayton, Ohio, succeeding **A. L. Freedlander**, now chairman.

Richard W. Holmes was made sales manager, eastern division-north, **E. F. Houghton & Co.**, with headquarters in Worcester, Mass. He replaces **O. R. Kerst**, resigned. **Lewis R. Tharp** was made assistant sales manager, Detroit.

Thomas Allinson, vice president - marketing, **Daystrom Inc.**, Elizabeth, N. J., will also head the company's newly formed Controlonics Group.

Thomas W. Schaid was made manager of **Allmetal Screw Products Co.'s** new midwest division at Chicago.

Philip C. Sayres was elected a vice president of **American Can Co.**, New York.

Charles R. Beacham was elected vice president, **Ford Motor Co.**, Dearborn, Mich., and assistant general manager, Ford Div. At the tractor and implement division in Birmingham, Mich., **C. B. Richey** was made chief engineer, research engineering department; **A. C. Quinn**, manager of the engineering test department; **C. T. O'Harrow**, chief tractor engineer.

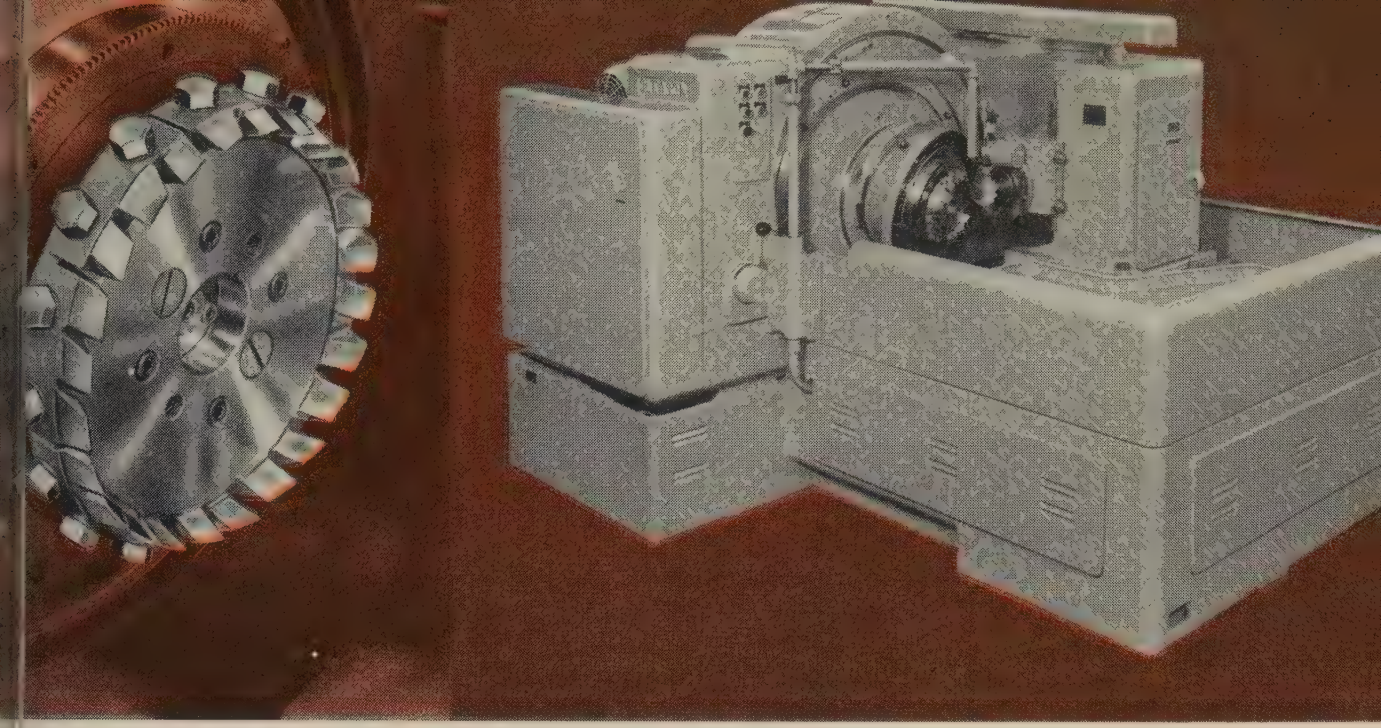
Carpenter Steel Co., Reading, Pa., appointed **Samuel E. Tyson** as metallurgist, stainless steels.

Herbert G. Schubert fills the new post of merchandising manager, **Cannon Electric Co.**, Los Angeles. **Alden C. Olsen** was made sales manager, Los Angeles division.

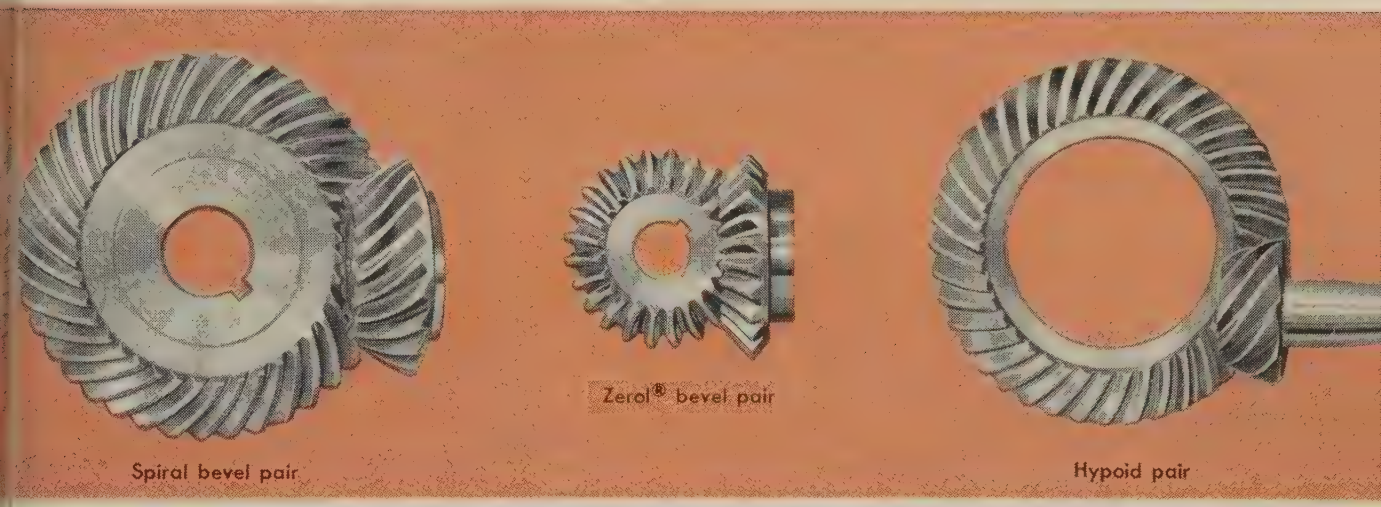
John L. Marshall was named assistant general sales manager, **Cyclone Fence Dept.**, American Steel & Wire Div., Waukegan, Ill., U. S. Steel Corp.

William E. Brandt was made assistant division superintendent of steel production, Fairless Works, Morrisville, Pa., **U. S. Steel Corp.** He succeeds **John D. Sutherland**, made division superintendent of the open hearth department, Homestead, Pa., Works.

Victor H. Lindberg was named division superintendent, structural rolling division, at **U. S. Steel Corp.'s** South Works, Chicago. He succeeds **Francis A. Snyder**, now assistant to general superintendent, South Works. Mr. Snyder succeeds **George S. Mican**, who moved to the Pittsburgh district as division



With *one* Unitool* Cutter and *one* machine



you can produce all three types

Now it takes only a relatively small capital investment to equip a shop for producing prototypes or small quantities of spiral, Zerol® bevel and hypoid gears.

The new Unitool Method requires only one machine, the No. 116 Hypoid Generator shown above or the smaller No. 106, and one Unitool Cutter to rough and finish both gears and pinions of a particular combination.

A total of six Unitool Cutters cover gears and pinions of all designs from 1.3″ to 8.0″ cone distance, 0.4″ to 2.2″ face width, and 16 to 2.5 DP.

Simplified, slide-rule calculations make it possible for even inexperienced personnel to turn out gears of high quality.

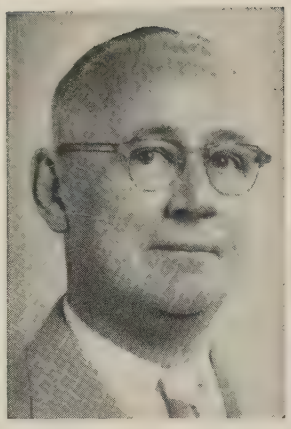
*Trade Mark

Gleason generators are versatile

The Unitool Method is only one of four that you can use on the No. 106 and 116 Generators. The same machines can be used for standard generating for medium gear and pinion production. In addition, for volume gear production they can be specially arranged for the Single-Cycle® Method where each tooth of a roughed-out, non-generated gear is finished in one cutting revolution of the Single-Cycle Cutter, or the Cyclex® Method where non-generated ring gears are both roughed and finished *in one cut* from the solid blanks.

For further information on the Unitool Method and for assistance with any design or manufacturing problem involving bevel gears, just write us.

JOHN M. PATTERSON
Beryllium Corp. sales mgr.



FRED ENGELHARDT
Byers purchasing director

GEORGE A. CHANDLER
Western Brass Mills plant mgr.

superintendent-rolling mills, Clairton Works.

John M. Patterson was made sales manager, **Beryllium Corp.**, Reading, Pa. He was assistant sales manager.

Fred Engelhardt was appointed director of purchases and traffic, **A. M. Byers Co.**, Pittsburgh. He has been purchasing agent.

Arthur F. Pelster was made vice president of aircraft products sales, **Leland Electric Co. Div.**, American Machine & Foundry Co., Vandalia, Ohio.

George T. Stevens was made sales manager, Metallon stamping plant, Canfield, Ohio, strip steel division, **Jones & Laughlin Steel Corp.**

International Harvester Co., Chicago, appointed **Harold W. Partheemer** manager, industrial engineering and construction department, succeeding **Otto A. Krueger**, retired.

Sidney S. Hulse was made general superintendent of production for the **Chevrolet** axle plant, Buffalo, General Motors Corp. Formerly plant production superintendent, he succeeds **Harold R. Main**, retired.

Dr. W. Kenneth Bock was made director of research, **National Malleable & Steel Castings Co.**, Cleveland. He succeeds the late **Harold Johnson**. Dr. Bock was manager of metallurgical research.

Allan B. Clow was named vice president-marketing, **American Cyanamid Co.**, New York, to succeed **Dr. W. G. Malcolm**, recently made president. **Anthony C. McAuliffe** was made vice president-engineering and construction.

George A. Chandler was made manager; **Melvin L. Henry**, production manager at the New Haven, Conn., plant of **Western Brass Mills Div.**, Olin Mathieson Chemical Corp. **Arnold G. Renken**, who resigned as production manager because of illness, continues as technical adviser to the Western Brass Mills' nuclear fuels and metallurgical research divisions. **Kenneth Soper**, former superintendent of mill products at New Haven, now fills a similar post at East Alton, Ill., succeeding Mr. Henry.

Finn Jensen, former purchasing agent in charge of nonproductive purchases at Carrier Corp., joined **Avildsen Tools & Machines Inc.**, Chicago, as district sales manager, Celfor Tool Div. He is at Syracuse, N. Y.

Sun Steel Co. appointed **Richard N. Haynes** and **Terry Donnelly** district sales representatives for Michigan with headquarters in a newly opened office at 202 Burwall Bldg., Kalamazoo, Mich. They were both with Solar Steel Corp.

Donald L. Colwell was elected vice president in charge of laboratories and research for **Apex Smelting Co.**, Chicago.

William H. Peters joined **R. D. Werner Co. Inc.**, New York, as products division manager. He was general sales manager of Brown Products Corp.

Ralph J. McKeever was named general manager, **Voight Machine Corp.**, Los Angeles.

Kenneth H. Meyer was made director of engineering, **C. B. Hunt & Son Inc.**, Salem, Ohio. He succeeds **C. S. Chessman**, resigned.

George R. Lewis was made plant superintendent of **Northwestern Tool & Engineering Co.**, Dayton, Ohio.

Fred J. Purdy fills the new post of manager of marketing for **Westinghouse Electric Corp.'s** welding department at Buffalo.

L. W. Moore was made assistant general manager of **Wheeling Steel Corp.'s** Steubenville, Ohio, Works.

Lawrence W. Cunningham was made southern regional sales manager, **Kelite Corp.** He is at Beaumont, Tex.

George Kepley was made district manager, industrial division, Beckley, W. Va., office of **Jeffrey Mfg. Co.** He succeeds **James Burke**, resigned.

Edwin O. Boldgett was elected vice president-research and development, **Commercial Controls Corp.**, Rochester, N. Y.

A. Merrill Smith was made domestic field sales manager, **Austin-Western**, Aurora, Ill., construction equipment division, Baldwin-Lima-Hamilton Corp.

Frederick J. Griffiths was made general manager, **Bossert Div.**, Rockwell Spring & Axle Co., Utica, N. Y. He succeeds **Charles A. Cooper**, promoted to vice president.

OBITUARIES...

Roger L. Dailey, 57, eastern division manager, **National Supply Co.**, died in Toledo, Ohio, Sept. 4.

William J. Farrell Jr., 54, president, **Bearings Inc.**, Milwaukee, died Sept. 6.

C. A. Kroos, 77, executive vice president, **Kohler Co.**, Sheboygan, Wis., died Sept. 3.

Arthur R. McHenry, 76, purchasing agent, **Symington-Gould Corp.**, Depew, N. Y., died Sept. 9.

...ate Stretcher

...ser orders unit with 30-million ...pulling power for installation ...Ravenswood, W. Va., mill

A PLATE stretcher with pulling ...er up to 30 million lb will be ...alled by Kaiser Aluminum & ...mical Corp., Oakland, Calif., in ...aluminum rolling mill at Ra...swood, W. Va. It will be built ...Hydraulik G.m.b.H. of Duis...g, Germany, with installation ...959.

Kaiser officials claim it will ...sess nearly twice the power of ... largest stretcher now in oper...n. The huge machine will be ...able of gripping the ends of a ...t plate of a high-strength alu...um alloy and lengthening it as ...ch as 5 ft. It will be able to ...dle a maximum cross section of ... sq in. Within the over-all limit, ... will accommodate thicknesses ... to 6 in. and widths up to 160 ... in lengths from 17 to 60 ft.

Demand Grows—With associated ...t treating and ultrasonic test... equipment, the stretcher will ...installed to help satisfy the in...asing demand of aircraft build... for larger and thicker plates in ... strongest aluminum alloys. In ...dition, demand is growing for ...avy aluminum alloy plates for ...es in the transportation and ship...lding industries.

The stretching action relieves ...sidual, internal stresses to pro...le better physical properties in ...e metal. Use of stress-relieved ...minum plates is highly advan...geous in the machining of in...cately shaped parts, such as ...ng sections, spars, and other ...uctural members.

Light gage sheets and foil are ...w being cold rolled and hot-line ...ate and sheet rolling facilities are ...der construction at the Ravens...ood mill. Kaiser Aluminum also ... building a reduction plant to ...oduce primary aluminum at that ...ll.

...oice Expands in West

...Boice Gages Inc., Hyde Park, ... Y., has added a new manufac...ring division, Boice Threads Inc., ...02 E. 96th St., Los Angeles 2, Calif. It will make thread plug and thread ring gages. A. A. Ruffalo, president of the former Gage Plating Corp., will remain as head of the west coast division of Boice Gages Inc. Boice purchased Nilsson Gage Co. Inc., Poughkeepsie, N. Y., last June.

Rawlins Buys Warehouse

Rawlins Bros. Inc., Los Angeles, has assumed ownership of the west coast operations of Solar Steel Corp., Cleveland. Services offered by Rawlins include decoiling, flame cutting and grinding, power saw cutting, shearing, slitting, and roller leveling. Solar will continue its steel warehousing and processing operation in other principal cities, including Cleveland, Chicago, Philadelphia, Detroit, and Baltimore.

Siegler To Make New Line

Siegler Corp., Centralia, Ill., through its Hallamore Electronics Co. division, has been licensed by Western Electric Co., New York, to manufacture telephone equipment. The agreement, one of the first issued by Western Electric to an independent supplier, covers the production of communications-type equipment. Amplifier stocks are being built up at the Hallamore plant in Anaheim, Calif.

Daystrom Reorganizes

Daystrom Inc., Murray Hill, N. J., organized its Daystrom Controlonics Group to provide industry with entire electronic systems for the instrumentation and automatic control of industrial processes. Formation of the Controlonics Group follows the recently announced organization of the Avionics Group which is specializing in providing complete systems for the guidance and control of aircraft and missiles. Thomas Allinson, vice president in charge of marketing, has been appointed operating vice president of the group in addition to his present responsibilities.

Daystrom units involved in the reorganization include: Weston Electrical Instrument Corp., Newark, N. J.; Daystrom Systems Div.,

La Jolla, Calif.; and Daystrom Electric, Poughkeepsie, N. Y.

ESC Opens New Division

ESC Corp., Palisades Park, N. J., has opened its Electronic Components Div. for the development and manufacture of specialty transformers and associated electronic components. John F. Nielsen is director of the division.

Levinson Steel Expands

Levinson Steel Co. has doubled the size of its warehousing and fabricating facilities and is formulating plans to expand its warehousing service for hot rolled and cold finished bars, as well as stainless and alloy materials. The firm operates stock and service centers at Pittsburgh and McKees Rocks, Pa.

NEW ADDRESSES

E. F. Myers, chairman and president, and **Mrs. Mabel G. Brace,** vice president and treasurer, Ironton Fire Brick Co., have moved to the firm's general offices at Ironton, Ohio. They were formerly at the Jacksonville, Fla., offices.

Screw Research Association moved its offices to 1015 Chestnut St., Philadelphia 7, Pa. Walter H. Gebhart has been elected president to succeed the late Harry Mayoh.

Corhart Refractories Co. moved its sales and administrative offices to 940 Commonwealth Bldg., Louisville 2, Ky.

Babcock & Wilcox Co.'s Tubular Products Div. moved two district sales offices to 731 James St., Syracuse 3, N. Y., and 66 Central St., Wellesley 81, Mass.

Bostitch Inc. moved to its new $6-million factory and headquarters in East Greenwich, R. I.

Executive offices of **Robertshaw-Fulton Controls Co.** have been moved to 911 E. Broad St., Richmond 19, Va. John A. Robertshaw,

rman, and John A. Robertshaw vice president, will continue to e their headquarters in Greens-, Pa.

NEW PLANTS

seph T. Ryerson & Son Inc.'s steel service plant at 6701 E. lish Ave., Indianapolis, Ind., is open for business. The is the warehousing subsidiary nland Steel Co., Chicago. Steel dling and cutting equipment in-e a high speed friction saw, rs, hacksaws, a mechanized e cutting machine, and two ge cranes. Robert L. Larson general manager of the new ity.

ac-U-Lift Co., manufacturer of erial handling systems, will a plant at Salem, Ill., which have four times the firm's ent manufacturing space.

anadian Titanium Pigments, a subsidiary of National d Co., New York, officially ned it titanium pigment plant Varennes, Que.

arker Rust Proof Co., De-t, opened a plant in St. Louis manufacture products for the face treatment of metals. Ron-P. Gajdos is plant manager.

ohn Aluminum & Brass Corp., roit, has established a facility Holland, Mich., to make extruded rative trim. Equipment in-les facilities for plain and color dizing, decorative painting, silk ening, buffing, etching, chemi-brightening, and forming and ricating operations in a wide ge of aluminum sizes and pes.

Benjamin F. Shaw Co., Wilming-, Del., is placing in operation branch plant in Tuscaloosa, . The company will manu-ture stainless steel pipe and will tall the pipe in some projects.

National Can Corp., Chicago, rchased the can manufacturing ilities of the former Phillips cking Co., Cambridge, Md. The

(*Please turn to Page* 114)

A Great New Vertical *4-Slid*

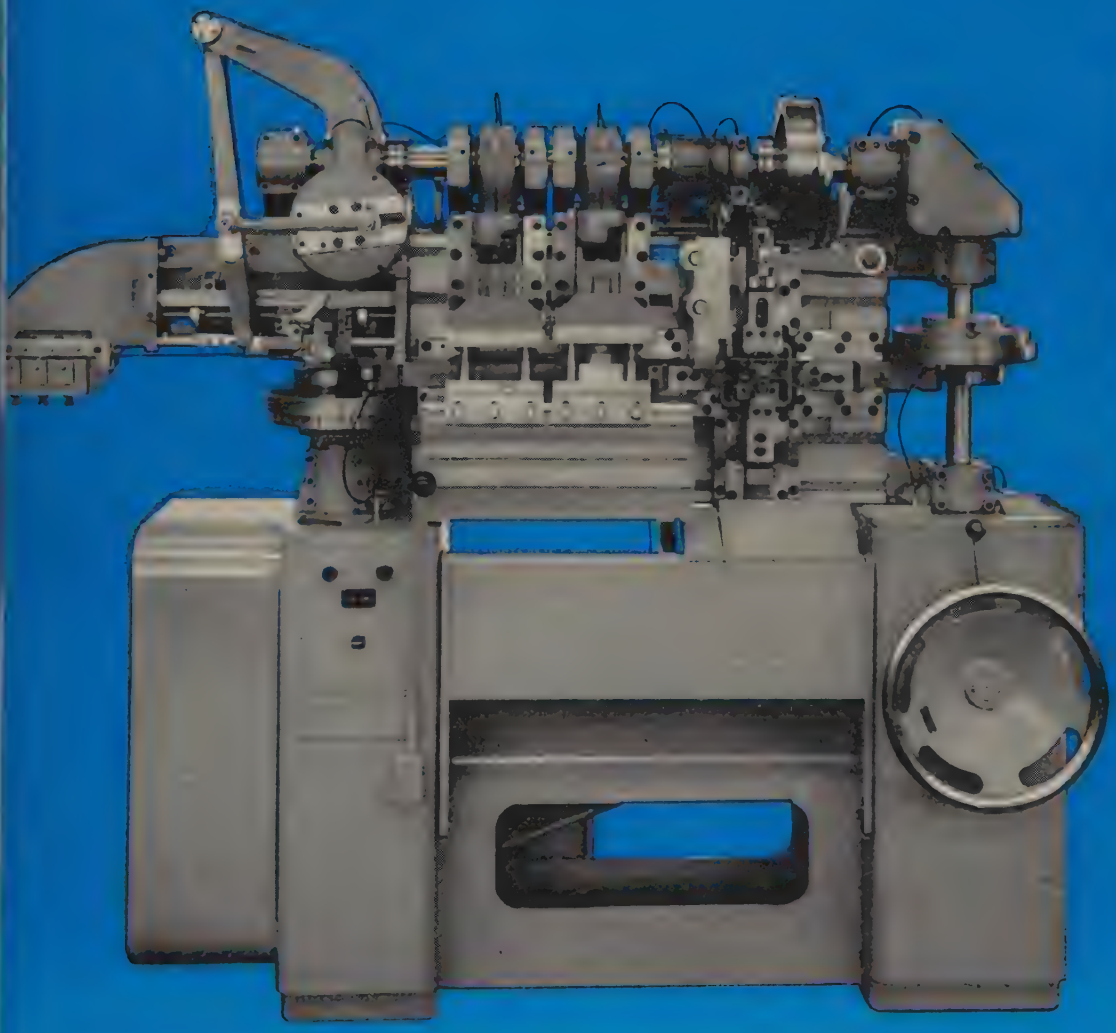
The Torrington Verti-Slide

This important innovation in the basic field of 4-slide production equipment offers so many advanced design features, performance advantages and cost-cutting facilities that it is making national news as a development of major interest to U. S. industry.

NATIONAL NEWS

For the Torrington *Verti-Slide* was designed to meet a fundamental need for greater versatility, lower tooling cost, faster set-up time and reduced floor space.

We urge you to investigate the *Verti-Slide* in detail at the Metal Show, Booth 1567, or through direct communication with our Machine Division.



THE TORRINGTON MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT · VAN NUYS, CALIFORNIA · OAKVILLE, ONTARIO

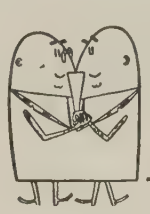
(*Concluded from Page* 111)

plant has a capacity for producing more than 3 million cans a day.

Jones & Laughlin Steel Corp., Pittsburgh, purchased the Lebanon, Ind., plant of Geuder, Paeshke & Frey Co., Milwaukee. The plant makes steel ironing tables and galvanized ware and will be operated by J&L's Container Div. Elliott Thomas will continue as plant manager.

Federal Tool & Mfg. Co., Minneapolis, opened a short-run stamping plant in North Hollywood, Calif. The property will be operated as the Federal Stamping Co. under the co-managership of William Bloomer (production) and Harold Griffiths (sales).

Electric Machinery Mfg. Co., Minneapolis, is erecting a 100,000 sq-ft plant. The firm makes large motors, generators, and control equipment. The expansion program will be a multimillion dollar project.



CONSOLIDATIONS

American Machine & Metals Inc., East Moline, Ill., purchased the name of **Rahm Instruments Inc.**, Westbury, N. Y., along with other assets. Rahm designs and fabricates intricate electromechanical instruments for aircraft and missile applications. As the Rahm Instruments Div., it will function as an adjunct to the Sellersville, Pa., plant. American Machine recently purchased **Hunter Spring Co.**, Lansdale, Pa., maker of fatigue testers, springs, force indicators, and metal stampings.

Parker Appliance Co., Cleveland, is purchasing **Hannifin Corp.**, Des Plaines, Ill., manufacturer of hydraulic and air power cylinders and presses, and miscellaneous components used in liquid, gas, or air pressure systems.

Nickel Cadmium Battery Corp., Easthampton, Mass., has been purchased by a wholly owned subsidiary of **Gould-National Batteries Inc.**, Trenton, N. J.

STEEL
September 23, 1957

Technical Outlook

CO_2 SHELL MOLDING—Close tolerances of shell molding and the time and money savings of the CO_2 process have been combined, says National Cylinder Gas Co., Chicago. Because all operations are carried out at room temperature, aluminum or plastic patterns can be used instead of the steel ones required to withstand the heat of conventional shell molding. One firm reports casting tolerances of ±0.002 to 0.004 in. per inch. Another foundry says it holds 0.010 in. per inch tolerances on complex impellers. Molds can be as thin as ½ in.

ISOTOPES REPORT— The AEC announced that this month marks its 100,000th shipment of radioisotopes from the Oak Ridge National Laboratory since the program started about 11 years ago. More than 4000 organizations are licensed to use radioisotopes; many others have received small quantities of radioactive material under general license.

OXYGEN IN COLUMBIUM— Researchers at Battelle Memorial Institute have developed a diffusion-extraction method for analysis where mean deviation of results at the 0.019 weight per cent oxygen level is less than 0.001 per cent. It's based on studies which showed that oxygen can be extracted from columbium at 2000° C in vacuum.

ALUMINIZING VALVES— Up to 3500 auto valves can be aluminized per hour in a new vertical high frequency machine developed by Lindberg Engineering Co., Chicago. A conveyer system (it's loaded and unloaded automatically) wrapped around the 14-ft-high cabinet moves the valves through the various operations. A metallizing gun sprays the preheated valves with molten aluminum; they are heated to form a hard, heat-resistant iron-aluminum alloy surface.

GLASS COATED TOOLS— A. O. Smith Corp., Milwaukee, is experimenting with glass coated punches and dies for deep drawing metal stampings. Results so far are encouraging. The company also has been working with glass coatings for the hot forming of metals.

LARGE STRETCH FORMER— What's said to be the largest radial draw former ever built is on its way to Convair Div. of General Dynamics Corp., San Diego, Calif. It will handle parts up to 40 ft long and can form one-piece circular bulkhead sections up to 12 ft in diameter. It was built by Cyril Bath Co., Solon, Ohio.

CERAMIC ADHESIVE—After testing 24 ceramic adhesives, the Department of Commerce reports: Shear strengths varied from 1200 psi at room temperature to 800 psi at 1000° F. Best performer: A porcelain enamel with a thermal expansion approaching that of ingot iron.

CHEAPER, PURER METALS— A new, inexpensive process for producing high melting point metals from their oxides yields a purer product than present methods, say research men at Illinois Institute of Technology. The method has been used to produce titanium, zirconium, chromium, hafnium, columbium, and vanadium. The oxides are reacted with aluminum under conditions that completely remove oxygen.

DESIGN BY COMPUTER— RW-300, a new digital computer which Ramo-Wooldridge Corp., Los Angeles, is making for use as a master control in manufacturing processes, was designed by another computer, an 1103A Univac. No circuit diagram of the RW-300 exists. The Univac "tested" the machine before it was built. It was put together from wiring instructions printed out on tape.

Metalworking Outlook—p. 73 Market Outlook—p. 153

Operator joins heavy magnesium extrusion and casting to a ⅝-in. plate for dock ramp. Single fillets such as this can be laid at 30 in. per minute. Penetration is about 3/32 in.

Magnesium Welded Faster

Cleveland company modifies standard, inert gas, manual welder. It claims that fabrication time is cut 80 per cent. Electrode contact does the trick

Here is a cross section of ⅝-in. plate with etched weld nugget. Weld requires three passes, two to fill the joint and one to clean up the opposite side

THE operator in the photo (left) is welding a magnesium plate with standard equipment (slightly modified) at 30 in. per minute. Speeds up to 80 in. per minute are possible on thicknesses of ⅛ in. or less.

The significance: Ray Miles, president, Lite-Line Industries Div., Copperloy Corp., Cleveland, says: "It is now economical to fabricate lightweight, heavy-duty equipment from thick magnesium plates."

Here are some of the outstanding features of the technique:

- It welds butt joints up to ⅜ in. thick in a single pass.
- Joining costs are from one-third to one-half those of tungsten arc (Tig) method.
- Speed and deeper welds cut fabrication time up to 80 per cent.

Invention—The reason for the success is a patented electrode contact inside the pistol grip. It is a simple device which eliminates arcing and flashing caused by poor electrical contact between the electrode wire and current carrying parts.

In standard models when burnback occurs, the wire fuses to the contact. The operator must shut down until the head can be disassembled and repaired.

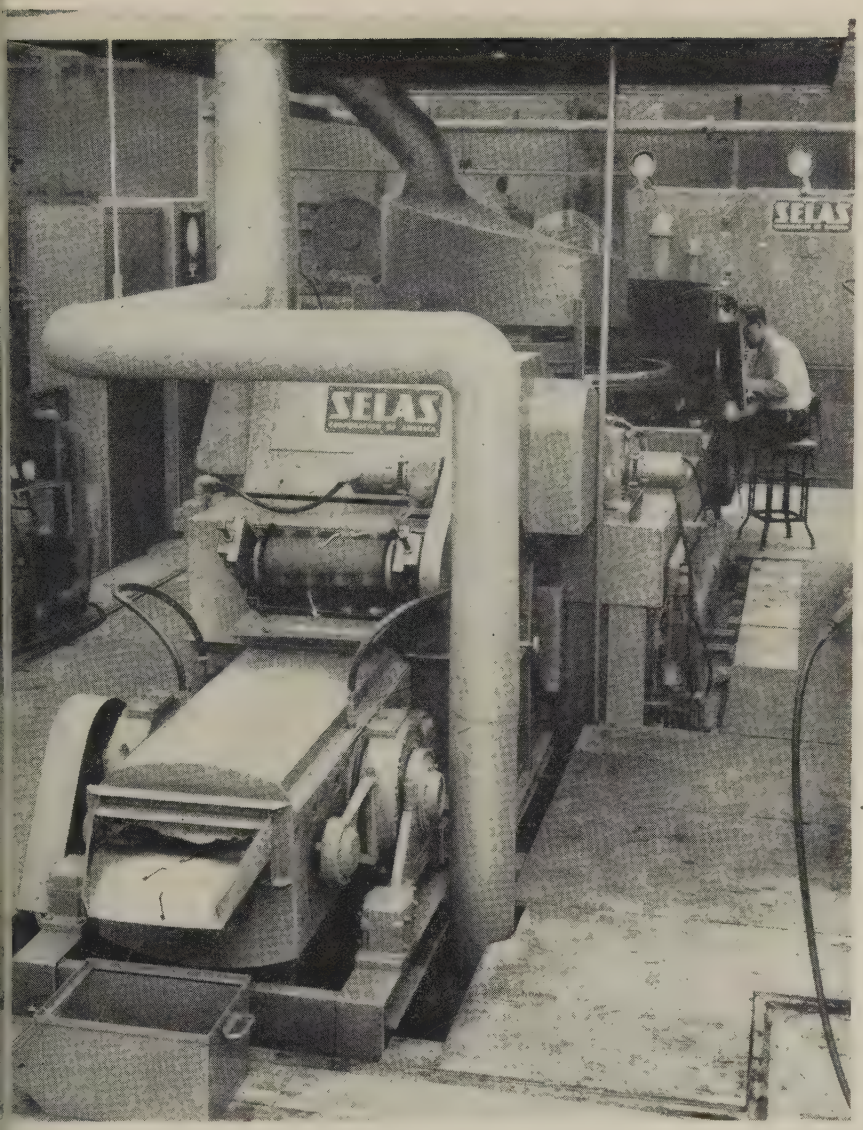
Such delays average more than 15 minutes per shutdown, forcing operators to use the slower tungsten arc (Tig method).

Tests—The variety of products made by Lite-Line Div. affords ample opportunity to test the device. Examples: Dock boards, yard ramps, flatcar aprons and similar material handling equipment. The firm also handles contract fabrications.

Some welds are 30 ft long. Material thickness ranges from ⅛-in. plates to heavy castings.

Easy To Use—The firm also found that its employees could learn the process in a short time. Several men with an average mechanical aptitude have made satisfactory welds after one day's training. Bend tests, etching, and tensile strengths show that welds are sound and strong.

Mr. Miles sums up with this statement: "Welding is a quick, easy method of joining. Now that the speed problem has been improved look for more products made from magnesium."



it treated, washed, and dried bars emerge from IBM's austempering unit and into a tote box. Temperature and motor controls are in cubicle in left kground; combustion controls are in cubicle in right background

ustempering Is Mechanized

automatic machine at IBM heats, quenches, washes, and es typewriter parts automatically. Installed in the pro- ction area, it simplifies work handling

By R. S. McFALL
Project Manager
Machinery & Process Div.
International Business Machines Corp.
Kingston, N. Y.
and
C. A. McFADDEN
Manager
General Industry Div.
Selas Corp. of America
Dresher, Pa.

ERNATIONAL Business Ma- nes Corp., Kingston, N. Y., has laced its twin-bath austemper- setup for electric typewriter e bars with an integrated, gas- d machine.

uilt by Selas Corp. of America, Dresher, Pa., the automatic unit has reduced manpower requirements 40 per cent, practically eliminated scrap, and cut nonproductive downtime.

Installed in the metalworking area close to the press that stamps out the workpiece, the machine forms a logical segment in the work flow. The handling of parts is simplified.

The Workpiece—The high operating speed of a type bar (the type face is soldered on it) calls for a hard, tough structure (Rc 42-44) and a flat shank ($\pm$0.001 in.).

The bar is about 4⅝ in. long, 9/32 in. wide, and 0.040 in. thick. It is stamped from AISI 1040 steel and bent at one end. All the bars in a typewriter form a segment of a circle when they are at rest, and each must strike the paper vertically. So the bars are press formed to a different angle for each character. At least 42 such shapes are required for each IBM electric typewriter.

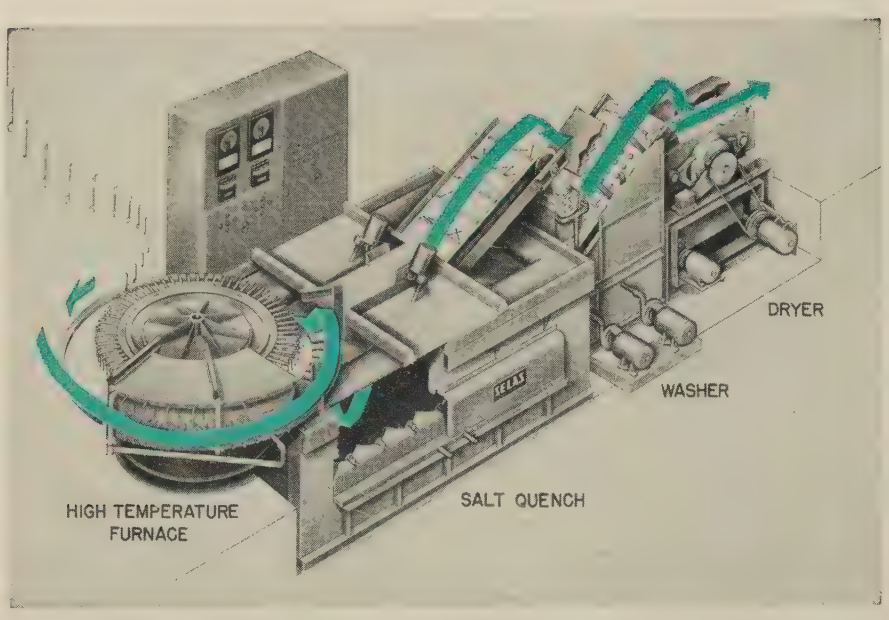
Required hardness and flatness are developed by heating the parts for hardening and quenching them in an elevated temperature bath to permit an isothermal transformation (austempering) to take place.

Former Operation — The bars used to be treated at about the same production rate in two salt bath furnaces—one for high temperature austenitizing and the second for isothermal quench. That equipment required five operators, involved considerable maintenance time, expensive fixture replacement, and large quantities of salt, plus other supplies.

When IBM moved its typewriter manufacturing operation to the Kingston plant, the austempering operation was selected for mechanization.

IBM production engineers and Selas process development men resolved the process into a basic time-temperature cycle. The curve was used to design a machine with a high temperature gas furnace, mechanized salt bath quench, and high speed wash and dry sections.

Heating Unit — The bars are



Drawing of integrated heat processing machine shows work flow and various units of the machine that produce austempered bars for electric typewriters

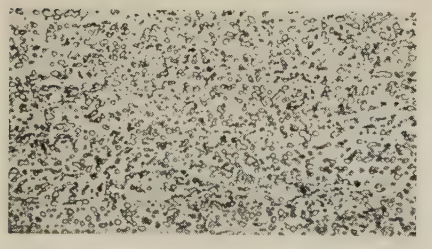
AUSTEMPERING . . .

loaded manually onto the chrome-nickel alloy fixtures of the high heat conveyer, which is a horizontal pinwheel that carries them past the burners in the high temperature furnace.

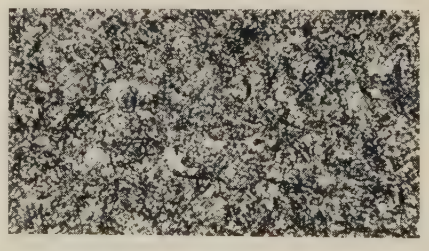
The furnace section is circular. A bar traveling through it is heated to 1550° F in 25 seconds. After being released from the fixture, it drops through a tube in the floor of the furnace and into the salt bath.

Burners—The furnace is fired by Duradiant burners set in the outer refractory wall. Each burner is a ceramic cup in which a controlled mixture of natural gas and air is burned. The flame wipes the cup, bringing it to incandescence, resulting in high intensity radiation of heat to the workpiece.

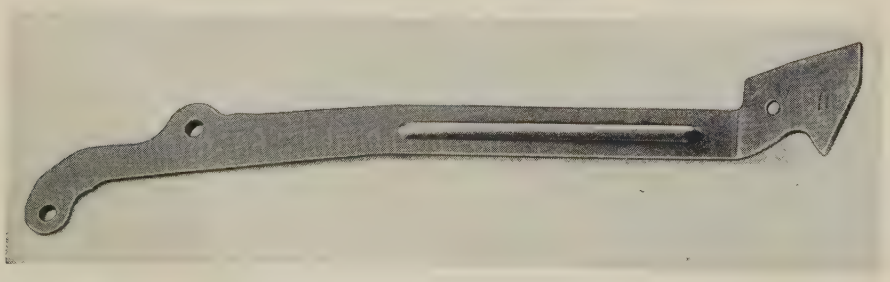
There is no flame impingement on the workpiece although burners fire directly at the bars at a distance of only 4 in. Burners are in horizontal rows in a pattern engineered to produce a uniform temperature throughout the bar by the time it is released for quenching.



As-Received



Austempered



This stamped bar requires austempering to produce the hardness and toughness necessary for long life and reliable service. At top are photomicrographs (X500) of bars before and after austempering

Operating Advantages — The principle of furnace construction and operation (it's known as Gradiation) offers several advantages. Three factors in combination protect the surface of the workpiece:

1. Controlled combustion of a rich gas-air mixture produces a slightly reducing atmosphere. 2. Tight furnace construction and positive furnace pressure prevent infiltration of excess air. 3. Total workpiece exposure to the heat is measured in seconds.

Quenching — The salt quench furnace into which the bar is dropped after reaching 1550° F is the largest component of the austempering line.

The bath is contained in a welded steel pot. It is enclosed to prevent dangerous splash of hot salt and to minimize heat loss. Two rows of Duradiant burners firing at close range, one row on either side of the pot, supply the heat. Twin propeller-type agitators keep the temperature uniform within 2° F throughout the bath.

The bar is held in the salt bath for 15 minutes and about 10 additional minutes on the salt quench conveyer. After it falls through a recirculating water spray, which cleans off the dried salt, it is carried up a belt conveyer and deposited in a circulating warm air dryer. The air is heated by a spark ignited, direct flame gas burner.

Metallurgy—The bars as received have a thoroughly spheroidized structure. After treatment, microexamination reveals a tough, fine-grained Bainite.

Other Plusses—IBM has moved austempering from a separate heat treat room to the production area, greatly reducing the amount of work handling required.

The machine is operated by three men instead of the five that were required. Dragout of molten salt is reduced, and a possible personnel hazard (periodic removal of sludge from the hot salt) has been eliminated. Downtime has been cut. The reject rate is lower, and scrap has been practically eliminated.

IBM has been operating the machine for about a year. A similar unit for heat treating cam levers is under construction.

US RUBBER PERMOBOND LININGS

How to prevent salty drinkers from getting "ulcers"

ɔdern Linden, N. J., plant of General Aniline & Film ation produces, each day, many tons of chlorine and . The 4 brine inlet filters and brine storage tanks (pic- ıbove) and miscellaneous brine-handling equipment the plant's 52 electrolyzers, all are lined with U. S. ɔond® protective rubber especially developed and unded for resistance to chlorine and caustic solutions. *ut this Permobond protection, the corrosive solutions attack and destroy the metal.*

ddition, Permobond was installed and vulcanized in caustic storage tanks, right on the job—an example of rsatility and adaptability of the Permobond process J. S." field engineering service.

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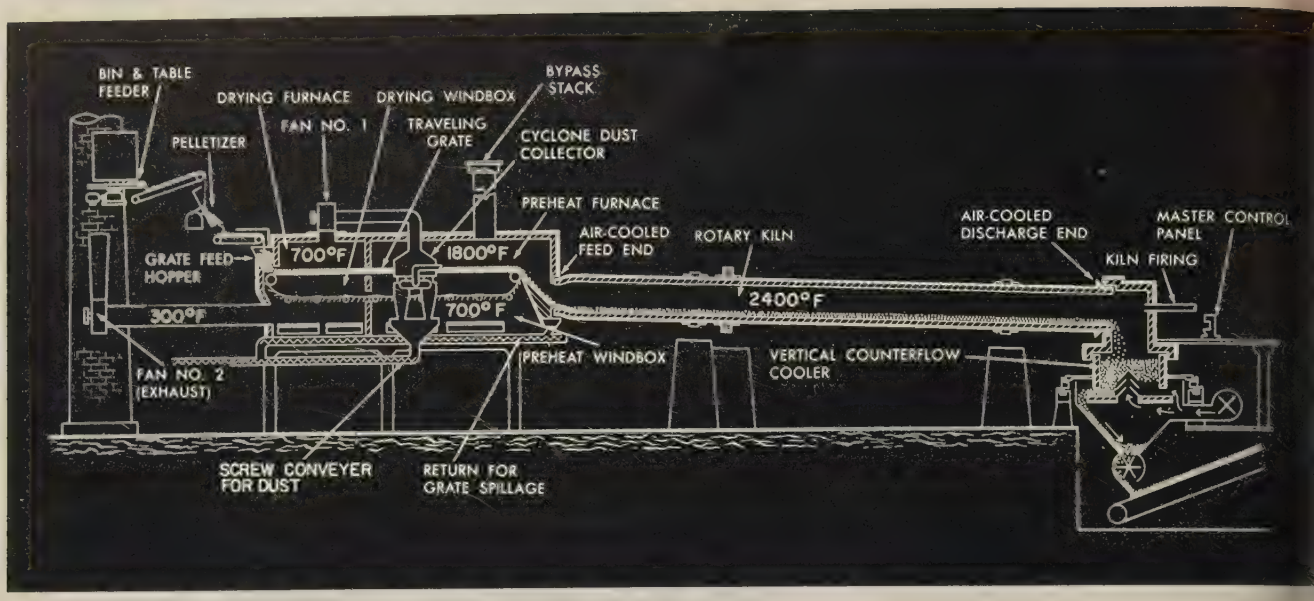


Schematic cross section of the Allis-Chalmers process for heat treating taconite (magnetite) concentrates. Over-all length of a 3000 ton a day plant would be about 300 ft

Furnace Makes Strong Ore Pellets

Combination grate and kiln design makes for efficient use of hot gases. Taconite pellets burned in the new furnace withstand rough handling

BETWEEN the beneficiation plant and blast furnace bell, losses in ore fines are a great frontier for cutting costs. One approach is to cut down the times an ore product (lump, sinter, pellet) is handled. Another is to make the product stronger.

Allis-Chalmers Mfg. Co., Milwaukee, has just announced a process for making strong taconite pellets. Pelletizing methods are conventional, but a flat grate furnace and a rotary kiln are used for hardening. Conservation of heat and cleanliness are said to be additional advantages of this process.

Pilot Plant—Steel industry and mining representatives have been studying the pilot plant at Allis-Chalmers' Carrollville, Wis., laboratory. The operation has four steps:

1. Forming pellets in either a balling pan or drum.
2. Drying pellets on a moving grate.
3. Heating (partially oxidizing) pellets on a moving grate.
4. Burning pellets in a short rotary kiln.

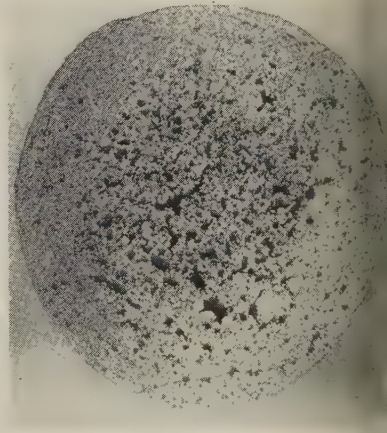
When steps No. 2, 3, and 4 are performed, the furnaces are an integrated unit.

Procedure—The process begins with the forming of ½ to ¾ in. pellets from finely ground moist magnetite (taconite) concentrates. A conveyer deposits the pellets in a hopper which feeds a traveling grate.

The grate carries the pellets into a drying chamber where they are subjected to a downdraft of hot gases at 600 to 800° F. They are the offgases from the preheat chamber, into which the pellets move from the drying chamber at a steady rate on the endless belt grate.

In the preheat chamber, the pass through a downdraft of high oxidizing gases at 1850 to 1950° F The gases enter the chamber fro the mouth of the rotary kiln, whic abuts the end of the preheat fu nace.

Fusion—During oxidation, ind vidual grains of transformed hem atite bridge together by gra



Enlarged cross section of the co pletely oxidized pellet. The poro structure aids in the reduction to pu iron when the pellets are smelted the blast furnace

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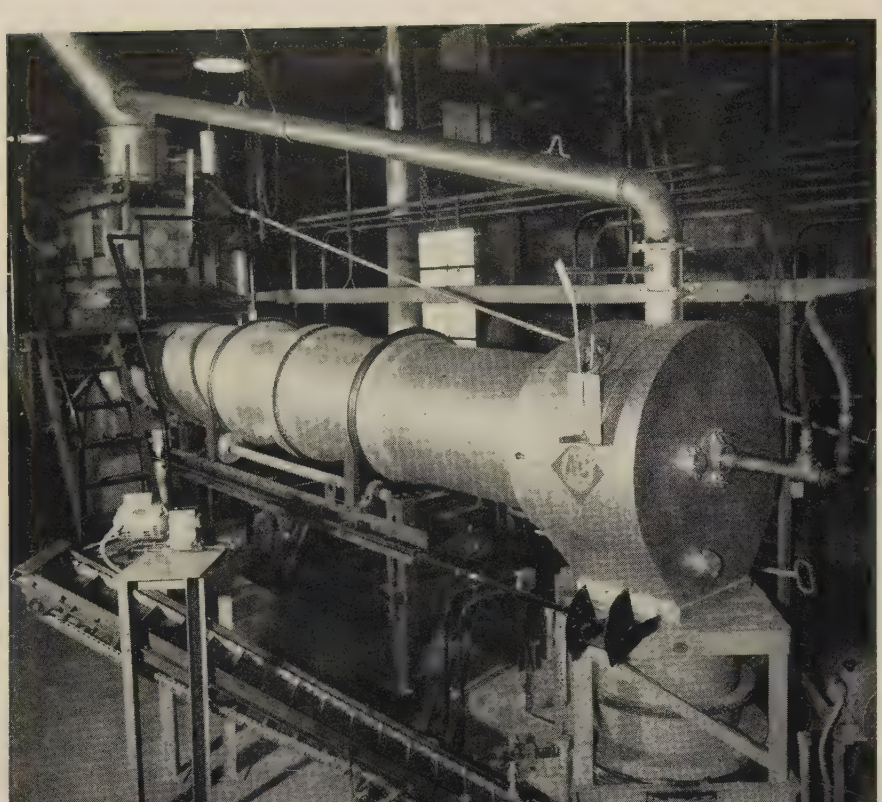


Pilot plant built by Allis-Chalmers at its Carrollville, Wis., laboratory where workability of the process has been demonstrated. Photo shows the exit end of the kiln

PROGRESS . . .

growth and recrystallization. This transformation from magnetite to hematite ($4\,Fe_3O_4 + O_2 \rightarrow 6\,Fe_2O_3$) develops great enough crushing strength (100 to 200 psi) to withstand the tumbling action of the kiln into which the pellets pass on leaving the preheat chamber. Although their internal structure changes, pellets do not fuse with each other because of insufficient surface contact.

In the kiln, gases between 2350 and 2450° F complete the development of the network of hematite crystals within each pellet. After passing through the kiln, they drop into a vertical counterflow cooler which recovers most of the sensible heat from them. Any dust the cooling air picks up from the pellets is carried through the kiln and stripped out of the air as it passes downward through the preheat and drying furnace grates.

Savings—Fuel economy is an outstanding feature. Largely, it is the result of efficient re-use of exhaust gases from one stage of the process to support reactions in others. Gases exhausted to atmosphere have a temperature of only 250 to 350° F. This arrangement keeps fuel consumption down to about 750,000 Btu per net ton. Any conventional solid, liquid, or gas fuel can be used.

Operating and maintenance costs of a production unit are expected to be low. Most of the dust and fines are retained within the system, where they are incorporated into finished pellets. Production rates obtained in the pilot plant range from 2.75 to 3 net tons of product per square foot of grate area per day.

The pellets have been tested in a standard ASTM, two-lifter bar drum for 200 revolutions. They show little breakage but do produce from 1 to 5 per cent fines from surface abrasion (considered to be excellent performance). It indicates that a full scale plant should produce a product that will withstand the abuse of handling and shipping.

Handles Hot Sand

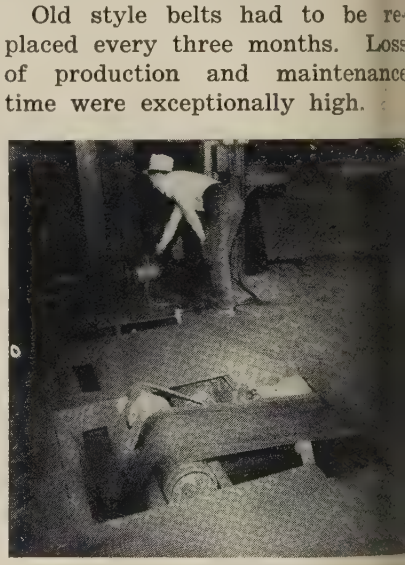
This conveyer belt will tak temperatures up to 350° F, las longer, says maker

A MALLEABLE iron foundry (I-l Mfg. Co., New Philadelphia, Ohio needed a conveyer belt that coul handle the sand from its ho shakeout.

The solution: A 4-ply belt o synthetic rubber. Called Solar flex by the maker (B. F. Goodric Industrial Products Co., Akron) it carries hot sand 24 hours a day five days a week: There has bee no shutdown in more than 1 months. Curtis Pollock, genera plant superintendent, says that th belts will last several years.

Costly Maintenance — The bel in the illustration carries 300° F sand from the shakeout. It dump it onto another belt which carries it to a simplicity screen. Sifted material is carried by bucket con veyers to storage bins.

Old style belts had to be re placed every three months. Loss of production and maintenance time were exceptionally high.



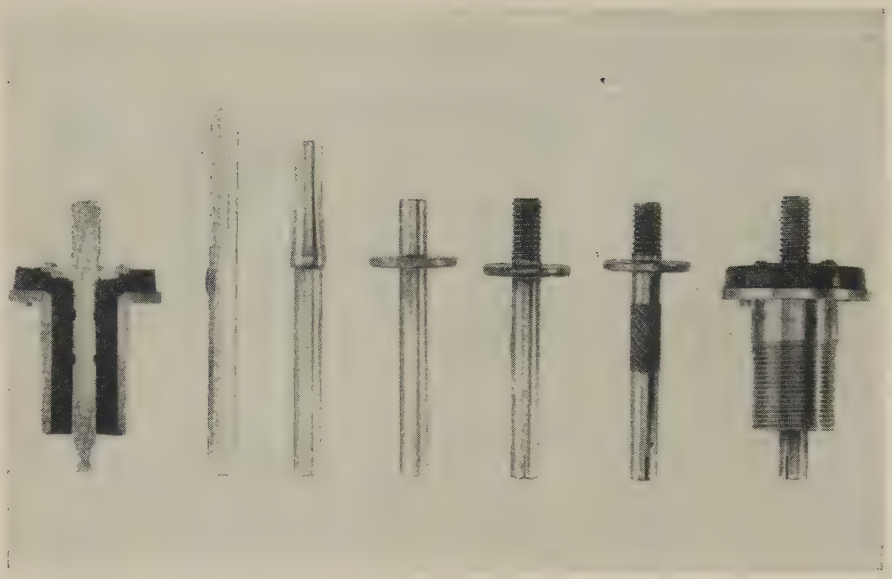
HOT SAND
. . . doesn't hurt this belt

Durable — Solarflex belts resis heat. The rubber remains pliabl and elastic when exposed for lon periods to materials as hot a 350° F, say Goodrich officials.

An outstanding feature of th belt is its construction which ge more efficient service from me chanical belt splices. In averag belts, fasteners tear out as th belt carcass hardens and crack from heat. They don't tear awa from Solarflex belts because th carcass remains flexible.

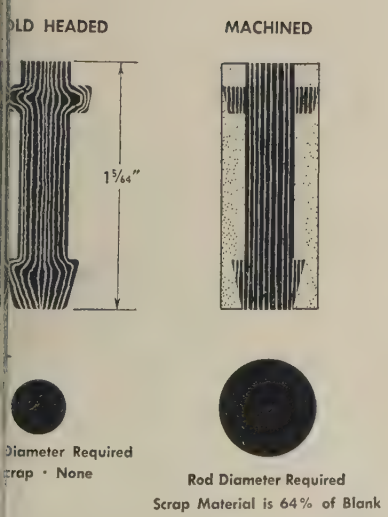
s metal and its alloys are
being cold headed into
many new shapes.
The potential is
almost unlimited
when it is used
vith secondary operations
slotting, drilling, tapping

By THEODORE B. SMITH
President, John Hassal Inc.



The center piece of this electrical component is cold headed instead of being machined. Result: Savings of raw material and time

old Heading Copper for Economy



l heading offers the advantage
dded strength resulting from a
dual flow of the grain structure.
ce the material saved

OUSANDS of standard and odd
ed fasteners and machine
s are being produced by cold
ding copper and its alloys.
he ductile alloys are easier to
than most metals. They of-
Substantial dollar savings, improved design, and increased strength.

Example—The center element of the cutaway part shown above was originally produced on a screw machine. A copper alloy rod with the outside diameter of the collar was turned down to the desired shape. The method required a substantial amount of machine time and resulted in a considerable amount of scrap (see at left).

Using cold heading, the wire stock is given a coning punch and headed to produce the collar. Then the part goes to two machines for threading and knurling, and, finally, a slot is cut at one end.

Cold heading the collar eliminated cutting an unusual contour that was formerly necessary to insure that the part was securely impressed in the compound surrounding it.

Advantages — To realize the benefits of cold heading, at least 5000 parts should be made. A high production rate is necessary to overcome the costs of making the dies and setting up.

Economy: Since the operation is entirely automatic, high volume is obtained in a short time. Manual labor is used only in setup and removing finished parts.

No Scrap: Compared with machining, the process produces virtually no scrap; no scale is formed, as in the case of hot forging.

Physical Advantages: Since the flow line of the metal's grain follows the contour of the section, there is an increase in the fatigue and shock resistance of the finished part. The tensile strength of some materials is increased by cold working.

Surface Finish: The smooth, compressed and toughened surfaces produced by drawing raw metal into wire are retained; excellent surface finishes result.

Design Factors: Cold heading gives close dimensional tolerances, smooth rounded corners and built-in fillets. No burrs are produced.

Selection of Materials — The quality of cold headed parts is maintained by carefully selecting only wire types which are ductile

COLD HEADING COPPER . .

and highly resistant to cracking

The wire should be free o scratches, seams, blisters and othe imperfections. If a high quality wire is not used, cracks and break develop on the surface where th original material has been upset t a larger diameter.

The material must be malleable so that it will fill out the die without developing dangerous shearing stresses. It also must be of the correct temper so that the finished product will have the desired physical characteristics.

This checklist will help you in your selection of the correct copper alloy to use:

High Brass—The most popular of the heading wire alloys, it has a special temper and surface, is ductile and malleable.

70-30 Brass—It is slightly more ductile than high brass.

Low Brass—A highly malleable alloy, this type is more resistant to general corrosion than high brass.

Red Brass—Used for ornamental jewelry, this brass has a rich golden color.

Commercial Brass—Since it resists stress-corrosion cracking, this alloy is recommended for outdoor construction.

Light Leaded Brass—These alloys are used for operations requiring good cold heading with light machining.

Duronze V—This type is immune to stress corrosion cracking and is highly malleable.

Phono-Electric—This alloy has an electric conductivity which is 40 per cent that of pure copper and is stronger than copper.

How Process Works

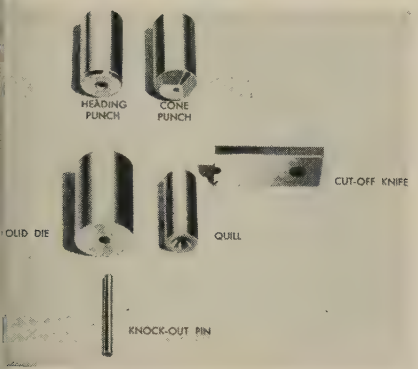
Metal is deformed beyond its elastic limit and takes a permanent set in the desired shape. Sections of wire or rod stock are sheared to length and formed cold by flowing between dies.

The stock is fed through straighteners and feed rolls into the cold heading machine where it comes to rest against a stop.

There are two types of machines, the solid die and the open die.

Solid Die Forming — The body die is a steel cylinder having an axial hole through it. Cutoff knives

COLD HEADING COPPER . . .

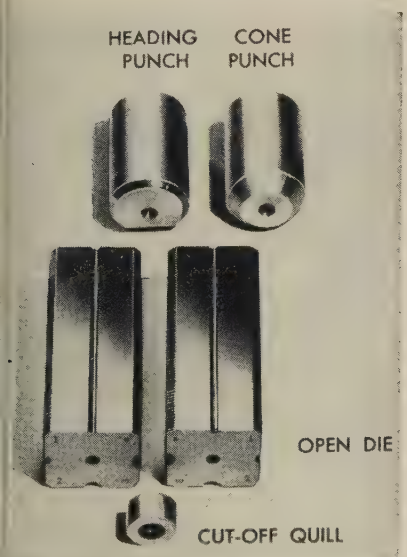


he components of a solid die used
n a cold heading machine

near the wire against a quill and
arry the blank to a position di-
ectly over the hole in the die.

The heading punch moves for-
ard and pushes the blank into
ie die until it is stopped by a
nockout pin. The forward mo-
on of the heading punch con-
nues and forms the head to the
esired shape in the punch, in the
ody die or in a combination of
oth.

Open Die Forming—Two identi-
al square ended steel blocks are
sed. Semicircular grooves along
ie sides of the two blocks form
ie body die when faced together.



an open die, the wire is gripped
the grooves by closing the gap
etween these die blocks

Wire feeds into the opening be-
een the die faces, is gripped be-
een the blocks, sheared and
rmed.

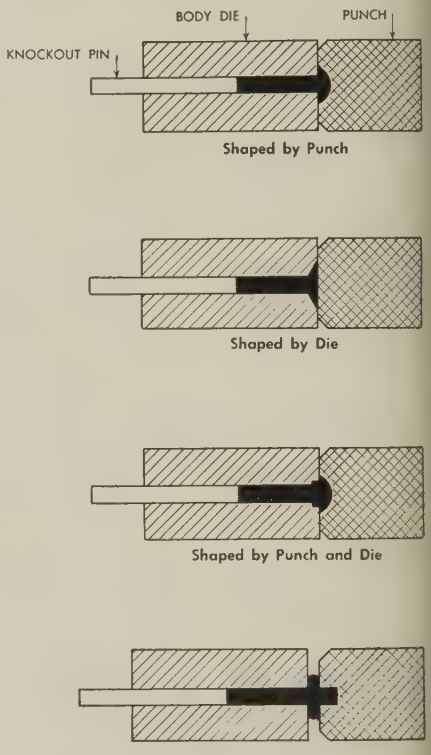
The blocks may open just wide
ough for the wire to be pushed
rough by the section following

COLD HEADING COPPER . . .

or they may open sufficiently wide for the part to fall through.

The upset can be formed in the cavity of the punch, in the body die, in the cavities of both, or between the dies. Up to 400 parts a minute can be made.

Open dies are used for forming long parts and where the wire blanks are of small diameter (less than 1/16-in.) since the knockout pin of the solid die would be so thin that it would not hold the blank during heading.



Four methods of cold heading

Multiple Blows—Many parts are made in several blows. The first gather the metal into a conical upset and the last continues this graduated flow into the final shape.

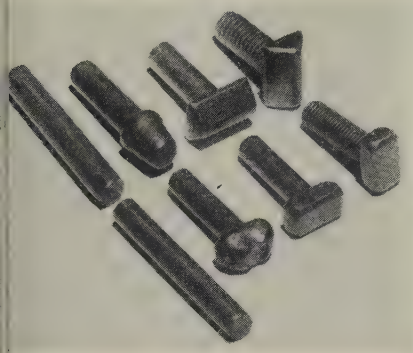
Two or more are used to assure that the wire upsets uniformly.

In applying multiple blows, the blank may be held in the original body die for all blows, or it may be transferred to one or more other dies for subsequent blows (progressive heading).

Supporting Operations — Other closely related operations are often required. Many fasteners and parts are first cold headed, then trimmed to shape.

Extrusion can be done on a cold heading machine. The stock is simply forced into a die smaller

COLD HEADING COPPER . . .

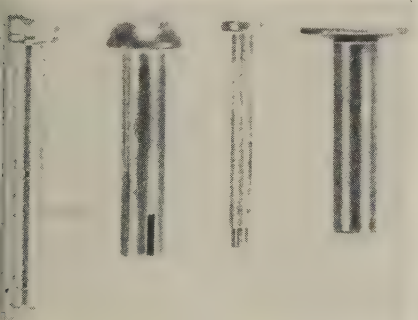


hese machine screws were made in vo blows. The metal was first gath-red into a conical upset, which the econd blow formed into the final hape. Threading completes the pro-uction of the screw

han the original diameter.

Roll threading is also done by old heading manufacturers. Head-l blanks are rotated under pres-ure between hardened steel dies. The threads of the dies upset he surface of the blank as it rolls etween them, displacing material o form the roots of the threads nd forcing the displaced material adially outward to form the rests.

Closer dimensional fits can be btained, and the threads them-elves are about 13 per cent tronger due to the cold working.

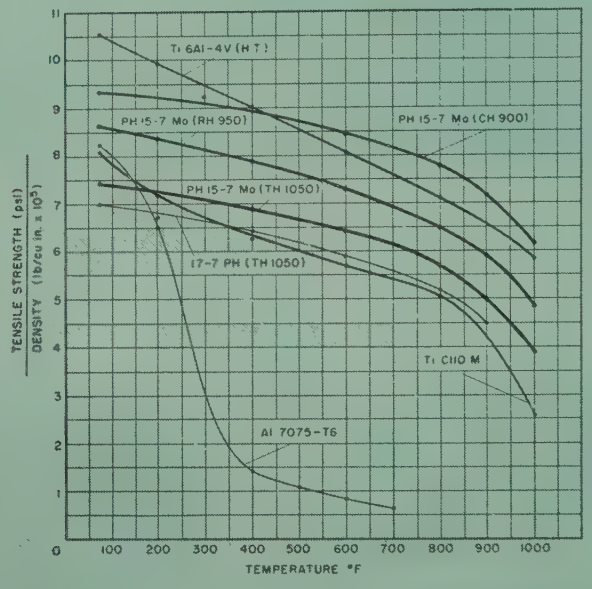


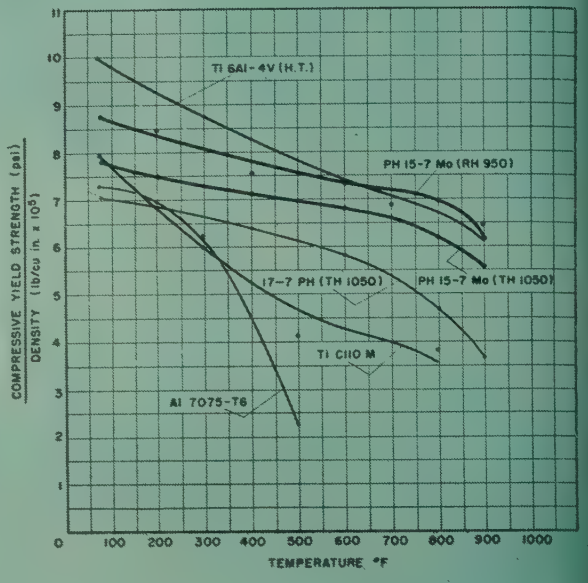
old headed copper parts which ave received secondary operations

Future Uses—The potential of old heading is almost unlimited hen it is used with secondary op-rations such as slotting, drilling, apping, threading, swaging, mill-ng, fluting, grinding, knurling, nd trimming.

A designer who can visualize he production of parts by com-ining cold heading with such sec-ndary operations will lower pro-uction costs, improve perform-nce and quality.

Strength-Weight Comparisons of High Temperature Alloys





New Steel for Hot Aircraft

Armco's PH 15-7 Mo steel can be used up to 1000° F, is readily available, and is easiest of high strength alloys to form

THE SEARCH for a precipitation hardening stainless with higher strength-temperature properties has uncovered a new alloy. It's designed for skins and structural parts of aircraft and missiles flying four times the speed of sound (about 2700 mph). At that speed, temperatures may reach 1000° F.

Developed by Armco Steel Corp., Middletown, Ohio, the steel, called PH 15-7 Mo, costs one-tenth that of high strength titanium alloys. It offers the ease of fabrication and corrosion resistance of 17-7 PH.

Composition—It contains 15 per cent chromium and 7 per cent nickel. High strength properties come from a strong precipitation hardening reaction fostered by 1.2 per cent aluminum.

About 2.5 per cent molybdenum is used in the composition to get good retention of the high strength properties up to 1000° F.

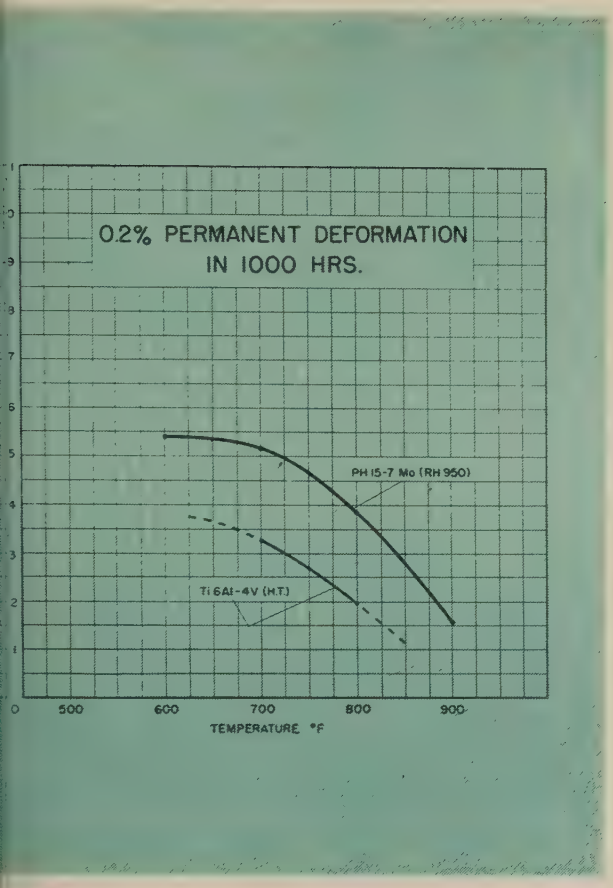
Carbon is controlled below 0.09 per cent. It permits the steel to be welded without the preheating or postannealing treatments that are necessary to minimize cracking when welding high strength martensitic carbon and stainless steels.

Formability—In the annealed condition, the steel has a predominantly austenitic grain structure, which makes it easier to form than other high strength materials, says Armco.

The steel does not temper or deteriorate in room temperature strength after exposure for long periods at 400 to 900° F. A slight increase in room temperature strength has been measured after it has been stressed above operating limits for 1000 hours at 800° F.

Hardening — Procedures for hardening may be varied to suit different production situations. When severe cold forming is necessary, Condition A (annealed) is used. If only mild forming is required, Condition C (hard, cold rolled) sheets and strip may be used to provide high strength with a simple 900° F heat treatment.

In either case, a partially hardened or transformed state must exist before precipitation hardening. The sequence of operations in fabricating and heat treating sheets and strip is shown on the opposite page.



ther with typical room temperature properties.

igh Temp Strength—A combination of the com- tion and the RH950 heat treatment produces a per cent increase in tensile strength at 600° F that of 17-7 PH steel in Condition TH1050. easurement of tensile stresses required to produce per cent permanent deformation in 1000 hours 00° F shows that PH 15-7 Mo steel is three times trong as 17-7 PH.

rength-Weight Ratios—Short time tensile, yield, creep strengths per unit of weight are compared other materials of high strength-weight ratios he top of these pages.

tensile tests, the inadequacy of the strongest mercial aluminum alloy for high temperature ice is apparent. The C110 M titanium alloy com- s to 17-7 PH steel in Condition TH1050. Above F, the tensile strength-weight ratios of the PH Mo steel bracket those of the heat treated 6Al- titanium alloy.

compressive yield strength, the precipitation dening stainless steels are superior to the C110 M, r cent Mn, titanium alloy. At temperatures above F, the PH 15-7 Mo steel in Condition RH950 lightly stronger than the heat treated 6Al-4V nium alloy.

formation on the long time creep behavior of dened titanium 6Al-4V alloy is scarce. From data and, it appears that the PH 15-7 Mo steel is su- or in its ability to resist permanent deformation er sustained loading for 1000 hours at elevated peratures. Much of the current research on the precipitation hardening steels and the titanium alloys is aimed at further improving creep behavior at the higher temperatures.

Production—Armco Steel Corp. is spending about $70 million for improvement and expansion at its Butler, Pa., Works to speed production of PH 15-7 Mo and other specialized steels.

To insure adequate supply, Armco will grant licenses to steel producers to make and sell precipitation hardening steels, says R. L. Gray, the corporation's president.

Properties of PH 15-7 Mo Sheets During Fabricating and Hardening

ANNEALED

(CONDITION A) ..... Ult ten str....130,000 psi
0.2% yld str... 55,000 psi
% Elong 30

Severe Forming Operations

Transform by Heat Treatment*

Heat at 1400° F for 1½ hr... Ult ten str....145,000 psi
and cool to 60° F within 1 0.2% yld str... 95,000 psi
hr. Hold at 60° F for mini- % Elong 7
mum of 30 min. Condition T.

Precipitation Harden**

Heat at 1050° F for 1½ hr... Ult ten str....210,000 psi
and air cool. Condition 0.2% yld str...200,000 psi
TH1050. % Elong 7

Alternate Heat Treatment*

Heat at 1750° F for 10 min... Ult ten str....180,000 psi
and cool in air. Refrigerate 0.2% yld str...125,000 psi
for 8 hr at —100° F. Condi- % Elong 7
tion R-100.

Precipitation Harden**

Heat at 950° F for 1 hr and... Ult ten str....240,000 psi
air cool. Condition RH950. 0.2% yld str...215,000 psi
% Elong 6

HARD ROLLED

(CONDITION C) .....Ult ten str....220,000 psi
0.2% yld str...190,000 psi
% Elong 5

Mild Forming Operations

Already Transformed by Cold Work

Precipitation Harden**

Heat at 900° F for 1 hr and... Ult ten str....265,000 psi
air cool. Condition CH900. 0.2% yld str...260,000 psi
% Elong 2

*A maximum expansion of 0.5% occurs with the change in phase.
**A contraction of about 0.04% results during precipitation hardening.

Tape Control Shines in Test

A job that takes 104 hours to do by tracer, including template preparation, takes only 3½ hours with numerical control . . . Packaged tape unit will sell for $10,000

HOW do you measure the effectiveness of numerical control?

The Aircraft Industries Association has come up with a helpful report.

Here's an example it cites—time comparisons for tracer performance vs. tape on the same part:

Tracer Control

Office paperwork	3.0 hours
Templates	97.5
Tracer machining	3.6
Boring	0.5

Magnetic Tape Control

Office paperwork	1.0 hours
Computer data processing	1.5
Machining	0.9
Boring	0.1

Including complete setup, that's 104.6 hours for tracer, 3.5 for tape.

The test showed a 66.6 per cent time reduction in office paperwork, a 98.5 per cent time cut in data processing, and 75 and 80 per cent cuts in contouring and boring times.

The tape control portion of the test was run on a standard machine which was converted to magnetic tape. Times are for the first piece run. (It was machined on the same day the shop first saw the drawing.) A close, 12-hour inspection turned up no cause for rejecting the part.

Packaged Tape Control

GE's Specialty Control Dept. is set to introduce a pre-engineered, two motion control package. Deliveries are scheduled to start in November.

Each unit will cost "under $10,000 net" and can be applied to any machine that requires point-to-point positioning of linear or rotary motions. The big potential will be on jobs where a specially engineered tape control unit couldn't be justified.

Called the Mark II, it is designed to control two motions from data stored in punched tape or manually set switches. It can be used on automatic or semiautomatic machines.

Milling Titanium

Do you need to do any milling on titanium? If so, here are some tips suggested by A. L. Winkler, senior manufacturing engineer, manufacturing research and development, Martin Co., Baltimore:

Use helical carbide (45 degree) slab mills. Avoid butt milling. Use 80 to 120 sfpm for carbide end and slab milling jobs. Use sulfur base oil flow or spray mist coolants liberally. Get dull tools out of the machine immediately. Don't try plunge cuts with carbide end mills. Design all fixtures for maximum rigidity. Cut in the direction of maximum support. With cast alloy cutters, use 80 to 100 sfpm. High speed steel cutters work best at 30 to 50 sfpm. Don't stop milling cutters while they're in the cut.

The list is abbreviated. A comprehensive article on titanium milling by Mr. Winkler is scheduled to appear in STEEL next week.

Cuts Milling Time

Throwaway cutters, a new milling head, increased speeds produce impressive savings

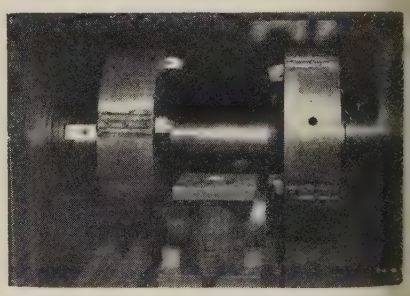
SPECIAL milling cutters using throwaway insert tools reduced machining time more than 80 per cent at Reliable Machine & Mfg. Co., Cedar Rapids, Iowa.

Tool costs are less than 1.5 per cent of those of the former method, says the toolmaker, Kennametal Inc., Latrobe, Pa.

Old Tooling—The milling cutters were developed to solve a machining problem with a chain-driven, No. 4 Becker-Brainard mill. Two, 3-in. faces were straddle milled on cast steel pivot ends held by a fixture.

Original tooling consisted of two, 12-in. diameter cutters. Each held 22, high-speed steel inserts.

The new cutters are 12 in. in diameter. Each has four cutter holders with Grade K21 square inserts. Inserts have eight cutting edges.



STRADDLE MILL
. . . saves with throwaway cutters

Heavy cutter bodies produce a flywheel effect. It helps overcome the limited power (5 hp) of the milling machine.

Speeds, Feeds Changed—The old setting of 31 rpm (with back gear) was changed to 240 rpm (750 sfpm). Feed was upped from 0.250 to 1.5 in. per minute.

Occasional hard spots in the castings formerly kept blade life at 5 to 50 pieces per grind. The new cutters can handle up to 800 pieces before wearing out—a 1500 per cent increase.

New inserts cost $6.80, or 0.85 cents for each piece machined.

By comparison, the high speed steel counterpart ran costs to 60 cents for each piece.

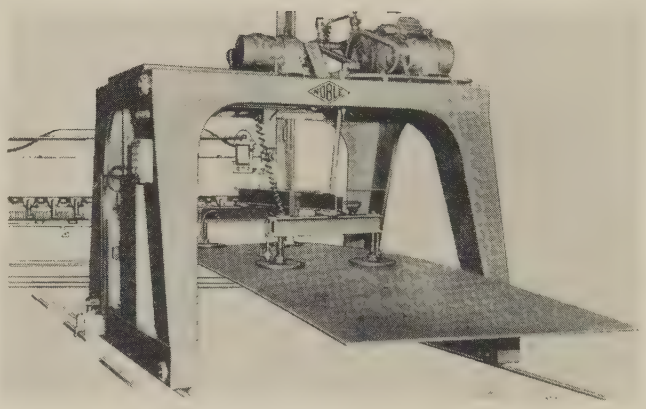
Automatic Plate Handler Moves 20-Ft Lengths

trip, sheet, or plate stock from 6 to 96 in. wide is vered to shears, presses, and cleaning or polish- machines by a line of plate handling systems. acities: 1000, 2000, 3000, and 4000 lb.

he handler will pick up from piles or conveyers nigh as 36 in. A vacuum lift handles virtually types of sheet or plate stock without marring shed or finished surfaces.

rotective coatings do not interfere with the op- ion.

ontrols can be set for automatic, semiautomatic, anual operation. *Write*: Noble Co., 1860 Seventh Oakland 20, Calif. *Phone*: Templebar 2-5785



Adjustable Speed Drives Provide Smooth Acceleration

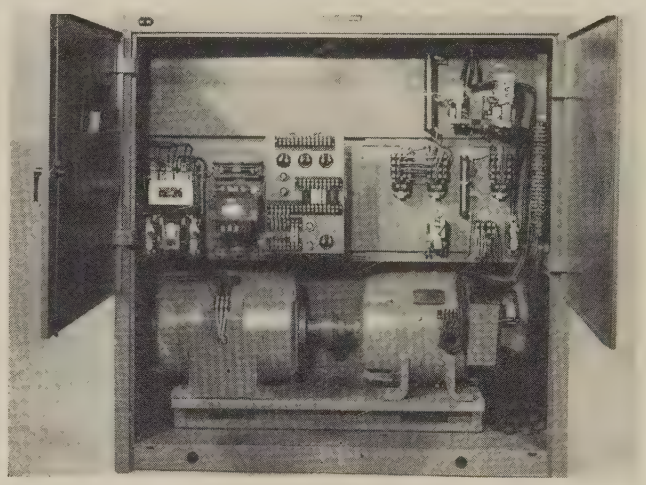
his line of Speed Variators, packaged adjustable d drives, comes in sizes up to 500 hp. Speed ges are available from 8:1 to 50:1, and higher.

he drives feature an Ampistat generator voltage ulator which uses silicon rectifiers. The silicon ifiers show no aging under normal conditions.

he static excitation system requires no warm-up od. It also uses silicon rectifiers.

he adjustable drives are designed for use on con- ous processing lines, calender drives, machine s, cranes, hoists, rolling and blooming mills— djustable speed or fine tension control.

lass B insulation is used in the drives. *Write*: ct Current Motor & Generator Dept., General tric Co., Schenectady 5, N. Y. *Phone*: Franklin 11



Lathes Have 32 Spindle Speeds, From 13 to 1500 Rpm

his line of lathes is used in toolroom and produc- turning. Model 2013 has a 21-in. swing over bed ways. Model 2516 has a 25-in. swing.

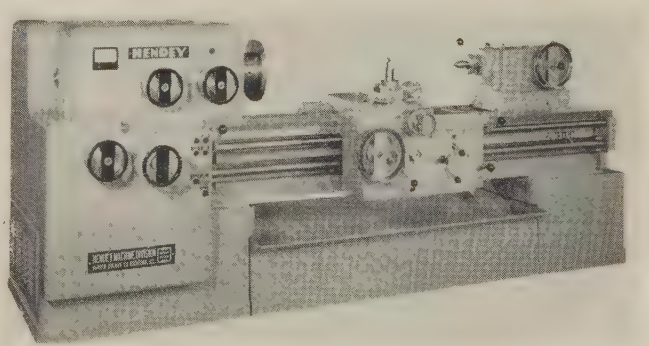
rowned, flame-hardened spur gears are used in head.

ou can get a large number of speed changes nerely shifting them. Only two large handwheels used to select and shift spindle speeds which are eometric progression.

ne spindle is supported at the ends and the middle hree sets of tapered roller bearings.

he two-speed tailstock permits rigid centering ork for fast turning.

multiple-thread indexing spindle cuts any num- of threads divisible into 48. Sixty-six thread and



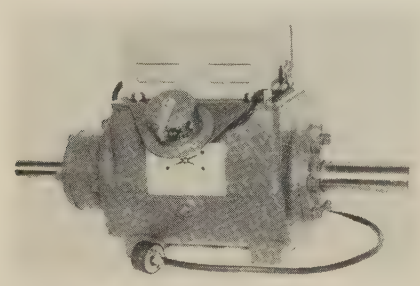
feed changes can be selected through two dials on the gear box. *Write*: Hendey Machine Div., Barber-Colman Co., Rockford, Ill. *Phone*: 7-5741

NEW PRODUCTS and equipment

Automatic Clutch

Model 8100-EC is an automatic clutch transmission. It can change speeds under power and can be reversed without stopping or reversing the motor.

Input torque rating is 700 lb-in. Output is 2800 lb-in. Capacity of the transmission is from 1:1 to 6.00:1. A reverse is possible with an adapter.

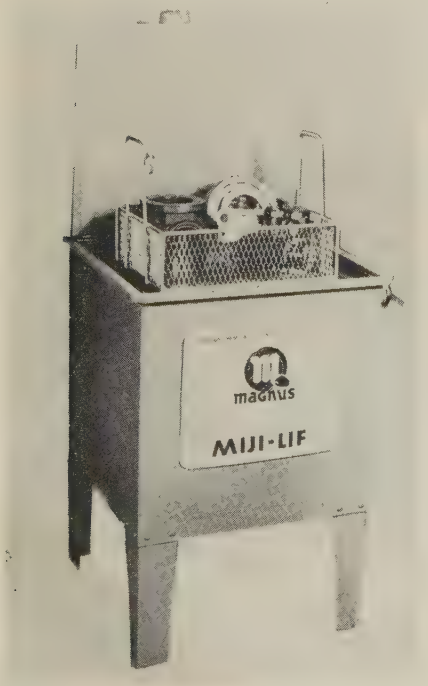


Electric clutches are used to change speeds with tape, time limit, cam, or other automatic controls. *Write*: Western Mfg. Co., 3400 Scotten Ave., Detroit 10, Mich. *Phone*: Tyler 6-1806

Batch Cleaner

The Miji-Lif can clean up to 75 lb of metal parts at a time. It can also be used to apply protective coatings.

Moving the operating lever brings the platform to the top of the tank and out of the liquid for inspection, loading, and unloading of the work.

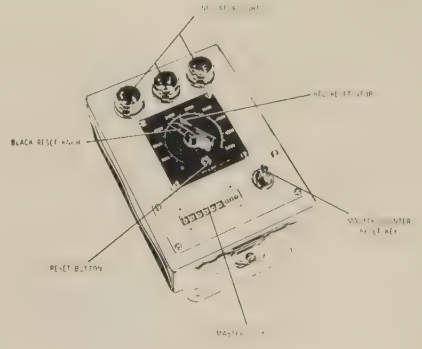


When the work is lowered to the bottom of the tank, it is automatically agitated up and down in the solution. The unit is operated by compressed air. *Write*: Equipment Div., Magnus Chemical Co. Inc., Garwood, N. J. *Phone*: Sunset 9-0200

Cutting Tool Control

Toolitrol consists of counter units installed on single or multiple spindle machines, providing visible signals when tools need changing.

The number of parts to be produced before a tool change is required is set on the unit. A green light on a control panel indicates that the machine and counter are operating. When the tool reaches 80 per cent of the number of cycles permitted, an amber light warns the operator.



The operator can see which tools can be changed during the next downtime period and handle them in groups on multiple spindle machines to reduce work stoppages.

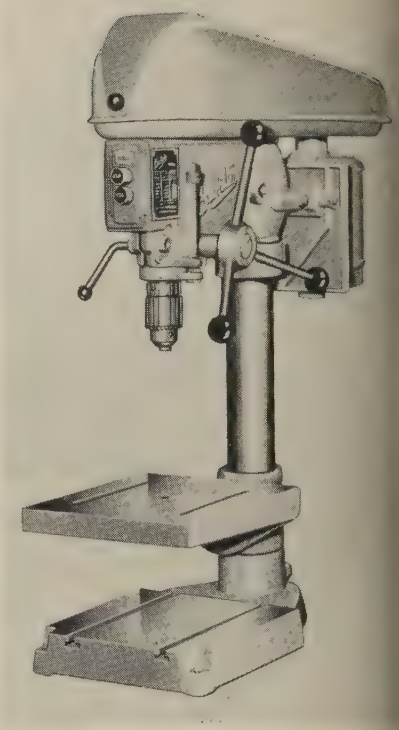
When the permitted number of cycles is reached, a red light indicates the need for an immediate tool change.

An optional relay will stop the machine automatically. *Write*: Scully-Jones & Co., 1901 S. Rockwell St., Chicago 8, Ill. *Phone*: Bishop 7-5900

Drills

The line of No. 15 drilling machines includes bench, floor, and pedestal models. Bench and pedestal types are available in one to six-spindle models.

The belt guard tilts upward to simplify speed changes. The motor bracket is hinged so that the belt



may be changed from one step to another on the pulleys without adjusting the bracket. Belt tension is maintained automatically.

No tools are needed to adjust the head or table. *Write*: Buffalo Forge Co., Buffalo, N. Y. *Phone*: Cleveland 4567

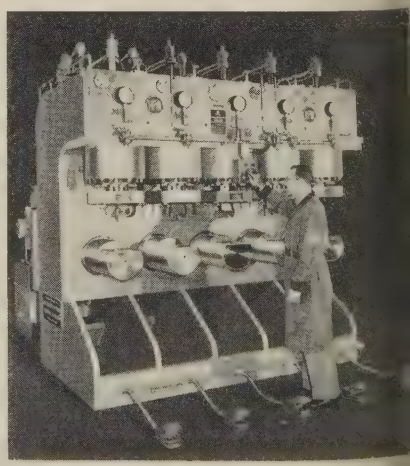
Multiple Station Press

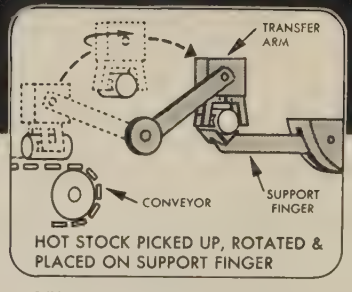
Punching and embossing are done by this open gap horn press. A welded steel frame houses five main cylinders and ram assemblies which are controlled individually by a pedal.

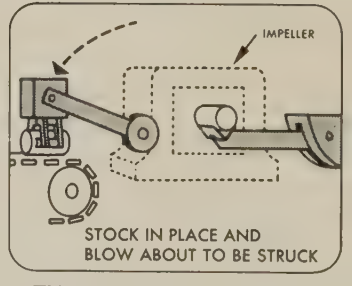
Each of the rams has a capacity of 100 tons. The tonnage of each ram is adjustable down to 4 tons.

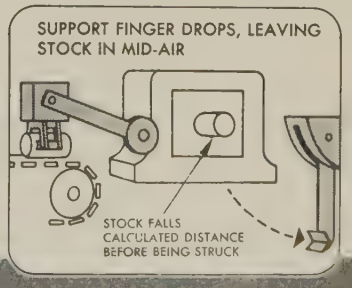
Each ram has a 6-in. stroke. Maximum daylight between the ram adapter and horn is 12 in.

The diameter at the base of each









ORGING IN MID-AIR . . . without grips . . .

hout sprues . . . without shock or vibration, *in a completely omatic operation!* This is but one of the possibilities in Cecomatic ging based on the revolutionary Chambersburg Impacter and izing the Cecomatic Gravity Feed. Investigate the potentialities the Cecomatic Process for forging production in varying degrees automation. Write or phone us.

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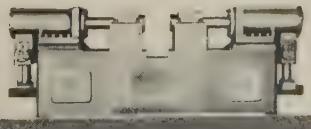
less, vibrationless forging  *in the IMPACTER is the basis of*

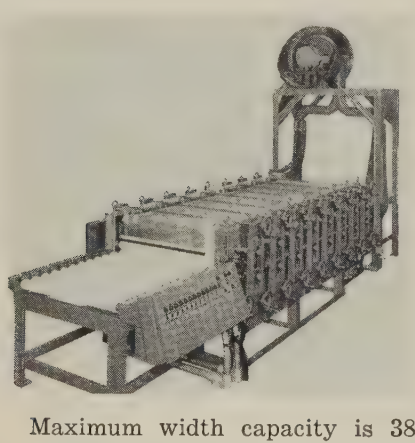
HE CECOMATIC FORGING PROCESS

horn is 11 in. Length of the horn from the throat is 20 in. From the throat to the centerline of the ram is 15 in. *Write*: Hydraulic Press Mfg. Co., division of Koehring Co., Mt. Gilead, Ohio.

Sheet Scrubber

Top and bottom surfaces of flat metal plates are cleaned of oil, grit, and surface accumulations by this industrial scrubbing machine.

A detergent and water solution is pumped onto the plates as they are conveyed through the machine by feed rolls. The plates are then scrubbed and scrub-rinsed with nylon cylindrical brushes. The plates pass through an air squeegee and come out clean, dry, and ready for subsequent operations.

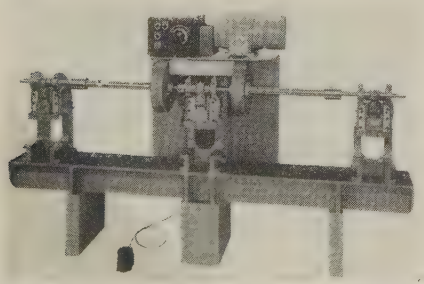


Maximum width capacity is 38 in. Sheets can be processed at a rate of 100 fpm. *Write*: Machine Div., Fuller Brush Co., Hartford 15, Conn. *Phone*: Jackson 2-2141

Triple Punch Press

Three 5-ton punch presses are mounted on a frame in this unit which does long, progressive die work and punching, forming, and blanking with long die sets.

Crankshafts and rams are synchronized. The drive engages the crankshaft at a central point, eliminating differences in torsional twist.



The presses are set on 42 in. centers. Total die area is 8 x 102 in. *Write*: Kenco Mfg. Co., 5211 Telegraph Rd., Los Angeles, Calif. *Phone*: Angeles 1-7955

Transmission Belt

Extremultus is a power transmission belt that will not slip or stretch. It operates at speeds up to 24,000 ft a minute and horsepowers to 6000. It will deliver smooth, constant speed at low tensions and relatively low speeds.

The belt will operate at ratios up to 20:1 and arcs of contact as low as 90 degrees. It reduces bearing loads and operates efficiently under shock loads up to seven times the normal running loads.

The belt is made of a special type of polymer and a chrome tanned leather. The polymer is the tensile member and the leather is the friction surface.

Tensile strength of the polymer is 28,500 psi. *Write*: Extremultus Inc., 405 Lexington Ave., New York 17, N. Y. *Phone*: Oxford 7-9180

Magnetic Clutch

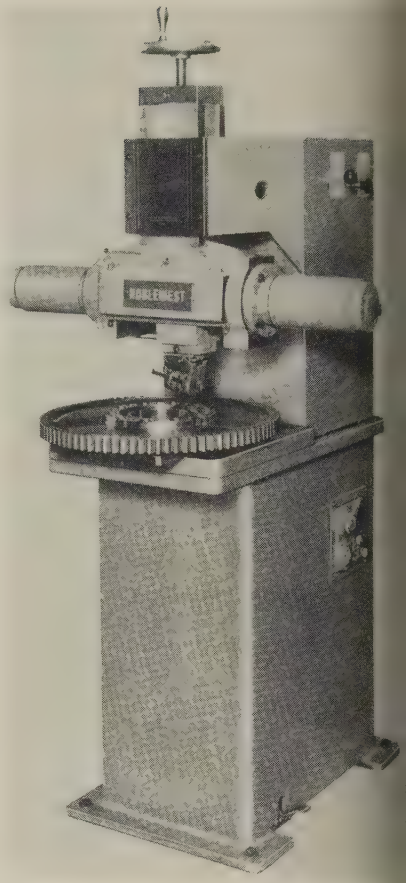
Torque ranges from 25 oz-in. up to 170 lb-in. are provided by a line of clutches. They use stationary magnets which eliminate collector rings.

All of the clutches are wound for direct current. Maximum ratings range from 28 volts on the smaller clutches to 90 volts on the larger sizes. *Write*: Stearns Electric Corp., 120 N. Broadway, Milwaukee 2, Wis. *Phone*: Broadway 2-1100

Marking Machine

Turbine discs for aircraft engines are roll marked by Model 487 Duomatic. The depth of mark is controlled by air pressure preset at a regulator. An air-operated slide accommodates the roll marking tools and travels laterally to perform the job.

A dual control system makes it possible to operate the pressure ram and the die slide independently



for short runs or for setup.

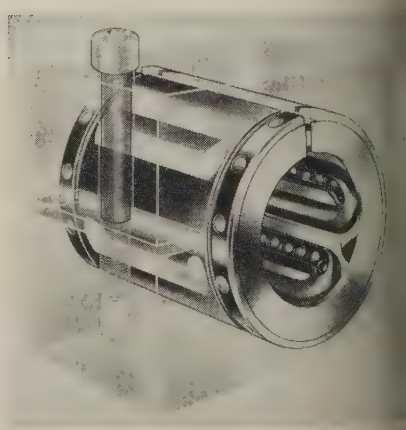
The large flat bed is suitable for similar large flat workpieces. The machine base and column are made to order so that gap and reach can be varied. *Write*: Noble & Westbrook Mfg. Co., East Hartford, Conn. *Phone*: Butler 9-2717

Bearing Adjusts Diameter

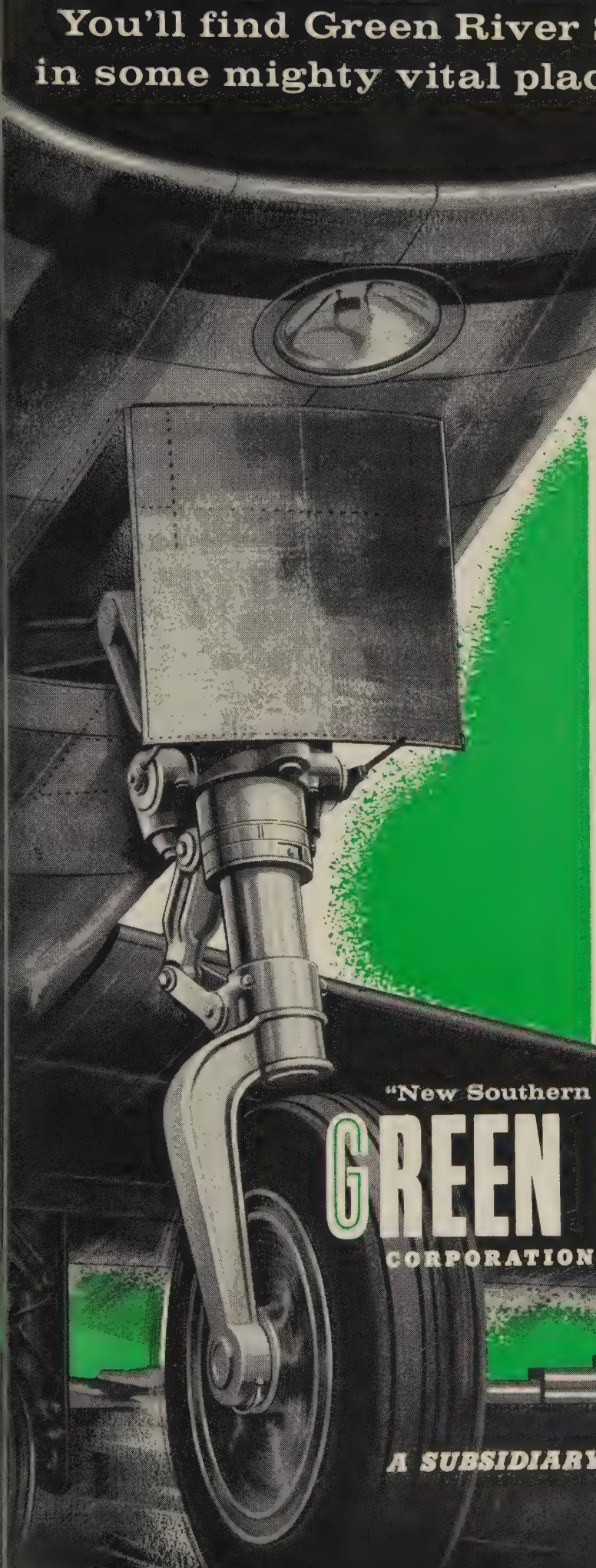
These ball bearings are split longitudinally to provide line-to-line or slight preload fits when mounted in an adjustable diameter housing.

The bearings are for linear motion. The tolerance on both the shaft diameter and the bearing bore can be adjusted.

Adjustable diameter ball bush-



You'll find Green River Steel in some mighty vital places...



Glance at the landing gear assembly of a modern aircraft and the chances are good that you'll be looking at Green River Steel. This vital mechanism must be able to withstand the impact of extreme shock loads at high and very low temperatures. That's why Green River is so often specified by name. The splendid new 60-ton arc-type electric furnaces down at Owensboro, Kentucky, are pouring steel to be processed under the exclusive Dornin patents which make MACRO-CLEAN steels of unmatched forging qualities and grain structure.

Even if you aren't in the business of producing critical aircraft parts, if you have reason to buy billets, bars or slabs of aircraft and commercial grade alloy, stainless or forging quality carbon steels, you can't do better than place your order with Green River—the steel industry's new Southern Star.

These Jessop district offices and representatives can now service you with Green River Products

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GREEN RIVER STEEL

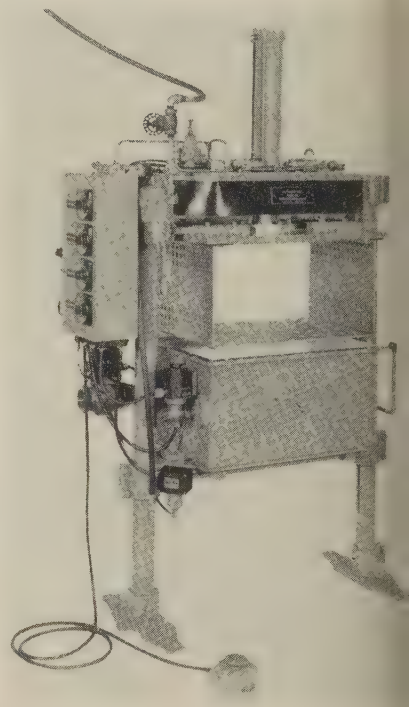
CORPORATION · OWENSBORO, KENTUCKY

A SUBSIDIARY OF JESSOP STEEL COMPANY

ings are available for shaft diameters of 1 to 4 in. *Write*: Thomson Industries Inc., Manhasset, N. Y

CO_2 Gassing

This vacuum chamber machine is used for gassing CO_2 cores used in making iron, aluminum, brass, and other castings.



It provides controlled gassing regardless of the size or geometry of the core. Use of gassing heads stabbing needles, and venting are eliminated. *Write*: Alphaco Inc. P.O. Box 827, York, Pa.

Brazing Rod

Ampco-Braz No. 2 is a low-fuming, manganese-bronze rod used in brazing and braze-welding steel, cast iron, malleable iron, copper and copper-base alloys. It is also used in overlaying bearings and other wear and corrosion resistant surfaces.

The rod provides smooth, dense, free-flowing deposits with excellent tinning action. Strengths up to 60,000 psi are produced. Deposit hardness is 80 to 110 Bhn. *Write* Ampco Metal Inc., 1745 S. 38th St., Milwaukee 46, Wis. *Phone* Mitchell 5-3750

NEW Literature

Write directly to the company for a copy

Self-Locking Bolts

Slotted-type "place" bolts, a cold formed bolt with an elastic diaphragm in its head (which furnishes additional elastic elongation when the bolt is tightened), are covered in this 8-page bulletin. National Machine Products Co., Utica, Mich.

Automation

Basic units for automation that is easy to retool are illustrated in Bulletin 117, 8 pages. Included is a description of a hydraulic slide for horizontal or angular motion. Baker Bros. Inc., Toledo 10, Ohio.

Bending Machines

More than 65 applications in bending tubing, pipe, extrusions, and rolled sections are illustrated in this 22-page bulletin, 356. Bending practices are discussed, and specifications of all standard machines are included. Pines Engineering Co. Inc., 601 Walnut St., Aurora, Ill.

Fork Lift Trucks

Bulletin 1317, 4 pages, describes a battery powered truck which has a capacity of 2000 lb at 48 in. A gasoline powered truck of the same capacity is covered in Bulletin 1380, 4 pages. Baker-Raulang Co., Box 5579, Cleveland 2, Ohio.

Precision Machining

Numerical control as applied to jig borers, vertical hole grinders, and other machine tools for the translation of blueprint data into a series of machine positions is discussed in a 12-page bulletin. Precision jig borer tools and accessories are listed in another 12-page bulletin. Pratt & Whitney Co. Inc., Charter Oak Boulevard, West Hartford 1, Conn.

Milling Machines

Bulletin 119 analyzes plain and universal models of a milling machine. Specifications include speeds, feeds, table size, rapid traverse speeds, and other capacity and operational characteristics. Greaves Machine Tool Co., 2011 Eastern Ave., Cincinnati 2, Ohio.

High Strength Steels

Bulletin ASL 289M, 4 pages, gives the results of the heat treatment of alloys containing chromium and molybdenum. Yield strength, tensile strength, elongation, reduction of area, and Brinell hardness at various annealing temperatures are listed. Tubular Products Div., Babcock & Wilcox Co., Beaver Falls, Pa.

Valve Catalog

This 136-page Catalog 57 covers a complete line of bronze and iron body valves. Included are bronze gate valves with a renewable seat ring, composition disc bronze swing check valves, and solder end globe valves with drain. A data section presents information for the fast appraisal of the pipe sizes required for particular flow applications. Catalog Dept., Fairbanks Co., 393 Lafayette St., New York 3, N. Y.

Battery Users' Manual

Motive power batteries (the type used in lift trucks), their maintenance, repair, and selection are discussed in this 44-page manual, GB-1599A. It is designed as an aid to plant engineers, superintendents, and foremen in conducting battery training courses. Gould-National Batteries Inc., Trenton 7, N. J.

Cold Finished Steel Bars

This wall chart lists machinability ratings and chemical analyses of 241 grades of steel bars including screw machine, resulfurized carbon, open hearth, and alloy steels. A table lists weights in pounds per foot of round, square, and hexagon steel bars in thicknesses or diameters of 1/32 to 6 in. Advertising Dept., La Salle Steel Co., P. O. Box 6800-A, Chicago 80, Ill.

Fasteners

One-piece screws with a ratchet-like element that grips the work securely are described in this 4-page bulletin. Pittsburgh Screw & Bolt Corp., P.O. Box 1708, Pittsburgh 30, Pa.

Machine Tools

Bandsaws, cutoff machines, drill presses, radial drills, grinders, and a belt and disc surfacer are included in this 48-page catalog. Capacities, speeds, and dimensions are listed apart from the general descriptions. Dept. 1000, Walker-Turner Div., Rockwell Mfg. Co., 400 N. Lexington Ave., Pittsburgh 8, Pa.

Safety Clothing

Lightweight clothing made of aluminized asbestos is illustrated in this 4-page bulletin. Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Pa.

Carbon Brushes

Bulletin GEA-6688, 8 pages, tells how to get the best performance out of carbon brushes. Topics covered include brush life, metal transfer, commutator threading, bar marking, and commutator adjustment. General Electric Co., 1 River Rd., Schenectady 5, N. Y.

Rectifiers

This 4-page bulletin describes selenium, germanium, and silicon rectifiers for electroplating, anodizing, and electrochemical processing. Frederic B. Stevens Inc., 1800 18th St., Detroit 16, Mich.

Carbide Tools

Catalog 857 tells how to select the proper tool for the job and shows detailed applications and dimensions of each tool. Full details are given on standard carbide tools and blanks, lapped inserts, and toolholders. Besly-Welles Corp, South Beloit, Ill.

Die Sets

Special die sets and bolster plates are described in a 16-page bulletin, 70-A, Section 2. Die Supply Div., E. W. Bliss Co., 1400 Brookpark Rd., Cleveland 9, Ohio.

Plating and Anodizing

An automatic machine which can plate or anodize up to 240 racks an hour is described in this 8-page bulletin. Lasalco Inc., 2820 LaSalle St., St. Louis 4, Mo.

Sealless Pumps

Uses and performance data of plastic and stainless steel pumps are included in Catalog 10.0, 8 pages. Vanton Pump & Equipment Corp., 201 Sweetland Ave., Hillside, N. J.

Spherical Bearings

Features and engineering data on a line of spherical bearings and rod ends are presented in Bulletin 257. Sealmaster Bearing Div., Stephens-Adamson Mfg. Co., Ridgeway Avenue, Aurora, Ill.

FILMS AVAILABLE

"Tooling the Bandsaw for Production" describes the versatility of this accurate tool. Shaping, slotting, splitting, and facing operations are shown in the 16-mm color movie. Time: 1[illegible] minutes. DoAll Co., Des Plaines, Ill.

"Hydraulic Oils" is a 25-minute color movie which shows the principles of hydraulic laws and demonstrates the uses of premium oils. The Texas Co., 135 E. 42nd St., New York 17, N. Y.

Market Outlook

TEEL is moving into consumption at a slightly faster pace than it was, but the pickup in consumers' specifications is disappointing. Automotive requirements are a little heavier than they were, so are orders from appliance and farm implement manufacturers. Still, over-all demands are not up to expectations.

ROCUREMENT STRETCHOUT—Consumers appear to be stretching out their orders over a longer period. They are buying largely for early needs. With relatively quick mill shipments available in most products (heavy plates and wide flange structurals are exceptions), there is less need to anticipate far forward requirements.

ONNAGE SUBSTANTIAL—Despite the comparatively slow pace of ordering (contrasted with that of a year ago) volume is substantial. In most products it compares favorably with that in most recent years, though the mills are not under intense pressure because of the greater availability resulting from increased production capacity.

HEET BOOKINGS UP—Automotive tonnage is swelling sheet order backlogs. September sales bettered August's, and October volume should be larger. Yet, mill sales managers think they will have to push customers hard to get a heavy forward tonnage. A few auto orders for November shipment are being received.

THER LINES GAIN—Steelmakers also note a bit of an upturn in demands from the farm implement industry. It was expected. Farmers are having a better year than they did in 1956, which should be reflected soon in increased implement production. Purchases by appliance manufacturers also are up, though far from boom proportions.

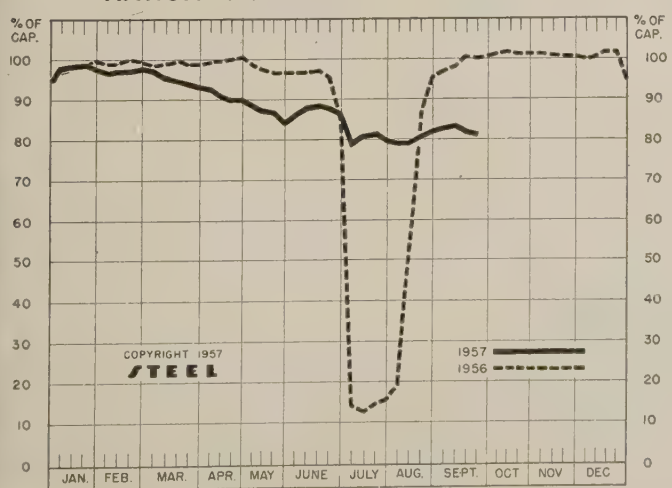
SHORTAGES FADE—Except for heavy plates and wide flange structurals, supply shortages have about disappeared. Standard shapes are in easier supply, and light plates are readily available. Sheets are a little harder to get; some producers of cold-rolled are sold out for October. Bars are available for prompt shipment in most sizes.

PRODUCTION—Steelmaking operations declined for the second straight week. The national ingot rate last week eased ½ point to 81 per cent of capacity. That is equivalent to production of about 2,073,000 net tons of ingots and steel for castings, or about the same tonnage produced weekly from mid-July to mid-August.

STRIKES REFLECTED—The post Labor Day showing in production is disappointing. But it is explained in part by labor trouble at a couple plants. Youngstown Sheet & Tube's Indiana Harbor and South Chicago plants recently lost five days' output due to an unauthorized strike. Republic Steel's Gadsden plant was down a couple days because of a strike by cranemen.

SCRAP DECLINING—Failure of the steel rate to rise sharply is responsible for the continued slump in scrap. Prices on the steelmaking grades are still falling. STEEL's composite on No. 1 heavy melting dropped another $2 for the fifth consecutive week. At $48.17 the composite is on the lowest level since the end of May.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Sept. 22	Change	Same Week 1956	Same Week 1955
Pittsburgh	82	+ 1*	98.5	99.5
Chicago	82	+ 2*	102	97.5
Mid-Atlantic	87	+ 2	98	93
Youngstown	79	+ 2	102	100
Wheeling	93.5	+ 1	97.5	96.5
Cleveland	80	— 2.5*	105	100.5
Buffalo	100	0	107.5	105
Birmingham	76.5	+ 3.5*	95.5	95.5
New England	52	0	92	88
Cincinnati	82.5	— 0.5*	89	85
St. Louis	83	— 3.5	88	92.5
Detroit	97.5	+ 0.5	99	95
Western	95	+ 1	99	94
National Rate	81	— 0.5	100	96

INGOT PRODUCTION‡

	Week Ended Sept. 22	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	129.2†	130.5	130.8	154.2
NET TONS (In thousands)	2,076†	2,097	2,101	2,477

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,559,490 in 1957; 2,461,893 in 1956; 2,413,278 in 1955.

Working Outlook—p. 73

Technical Outlook—p. 117

Good Materials are only the beginning of good steel

It takes good men — every step of the way — to produce good steel from even the best of materials.

As a supplier, the most we can do is to furnish your men with the finest nickel alloys we can produce — sealed, furnace-ready cartons of uniform pig, each marked with exact weight and analysis. While we know that quality material alone may not insure good steel, we're confident it's one of the essentials.

If you are still using scrap for your alloy requirements, ask us about Alloymet pig today.

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DAVENPORT, IOWA

World's largest producer of secondary nickel alloys of certified analysis

Westinghouse Electric Corp.

ng demand for large power transformers like this means. . .

ilicon Steel To Go Places

E OLD RULE that generating city doubles every ten years require amending soon. Elec- equipment manufacturers now us they expect capacity to ble every seven years."

hat's what officials at Wheel- Steel Corp., Wheeling, W. Va., It's one major reason why and other producers are ly optimistic about long term outlook for silicon steel. The uct is a must in electric mo- rotating equipment, genera- and transformers.

eady Growth—Use of mag- steels doesn't grow in direct ortion to use of power be- cause larger units use steel more efficiently, and the steel itself is constantly being improved. But growth in production of oriented and nonoriented silicon grades is not far behind that of the electrical industry.

Other electrical sheet producers are equally cheerful as they view the future, although they admit to certain dull spots in the current market picture. Says a Pittsburgh producer: "Sales of nonoriented silicon sheets are low because of a lack of strength in appliance manufacturers' orders. Demand is firm for grain oriented silicon, but supply in the second half of this year is ample to meet requirements. Until power and distribution requirements slipped early this year, demand had required capacity operations for all grain oriented facilities."

Could Be Tight—Producers of grain oriented silicon can't rest too long in the fourth quarter. Sales managers warn that a general tightening in sheets during the final quarter could result in some users of silicon having difficulty obtaining all they want. At least one producer has warned its customers to place orders now for the October-December period if they want to be certain of delivery.

Statistics show sales in the first half of 1957 trailed record years by about 15 per cent. The record year for production was 1953, when shipments totaled 820,096 tons. After slipping in 1954 and 1955, shipments climbed back to 813,381 tons in 1956. At a slightly slower pace, shipments in the first seven months of 1957 came to 401,200 tons. There is no comparable figure for 1956 because of the industry strike.

Inventory Problem — Salesmen face a double inventory problem in selling silicon to appliance producers this year. Those manufacturers built up large stocks. When their sales failed to meet expectations, they held inventories of silicon as well as unsold appliances containing silicon.

In some cases, strong competition in the appliance industry curtailed use of electrical sheets. Some electric fan manufacturers reportedly substituted carbon steel for silicon to lower costs. Silicon salesmen say this lowers the fan's life expectancy as well as its initial cost. The consumption of current is higher in carbon steel fans. Substitution of carbon is said to be satisfactory in motors that run for short periods intermittently.

Slow Today—Sales of silicon to producers of fractional horsepower motors are slow. Requirements for small motors in such appliances as garbage disposal equipment dwindled this year due to the lower rate of home construction.

Several markets show considerable strength. Demand is good

from producers of integral motors. Sales are strong to manufacturers of heavy rotating equipment. Export business is fairly good, despite a falling off in purchases from South America. Sales to Canada and Europe are steady.

But Faster Soon—Silicon sales managers assume a more cheerful air when talking about 1958 and beyond. One producer predicts 1 million tons of silicon sheets will be produced annually in the early sixties, with demand approaching 1.2 million tons by 1964.

Producers back up the prediction with expansion plans. Wheeling Steel announced plans for a new continuous core plate line for silicon steel coils at Beech Bottom, W. Va. Last year a continuous annealing furnace was installed at that plant. Armco Steel Corp., Middletown, Ohio, is carrying out construction of new facilities to increase production of grain oriented electrical steel in 1958. Republic Steel Corp., Cleveland, completed an expansion program in Warren, Ohio, early this year. While the capacity may be more than is required this year, don't look for it to remain idle for long.

Stainless Steel . . .

Stainless Steel Prices, Page 171

Gradual gains are reported in sales of stainless strip to the automotive industry. Producers are hoping for more improvement next month because strip is one of the slowest moving stainless items.

In other stainless products, demand is steady. Plates, sold to producers of industrial equipment are in strongest demand.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 166 & 167

Sheet order volume is increasing, largely reflecting improved demand on automotive account.

Tonnage placed for October shipment in the East is well above that for shipment this month. Some automotive tonnage is coming through for November delivery. Other consumers are not stepping up specifications in like degree. Buying by most users continues to be spotty. The improvement in demand on automotive account extends to the 430 grade stainless.

While buying by New England consumers is slightly heavier for October, third quarter volume (notably September) is under expectations. Over-all tonnage trails that of last year by 15 to 20 per cent. Auto requirements in the area are only slightly heavier. One of the largest stamping plants (at Boston) is down. Buyers are not anticipating requirements to any great extent with prompt shipments available. A New England producer of cold-rolled strip is curtailing production of carbon grades, concentrating on more profitable finishes and edges. Competition with slit sheets prompts this change in product policy. Stainless production will be stepped up.

After a gradual gain this month several of the larger Pittsburgh sheet suppliers expect a leveling off in demand, with October's total shipments slightly above those of September. November tonnage is

ected to about equal that in tober. Sellers' estimates are luded by uncertainties with re- ct to new model auto sales. Gains in sales to appliance mak- are reported, but they continue small lots.

einforcing Bars . . .

Reinforcing Bar Prices, Page 165

Reinforcing bar producers in the cific Northwest continue in full duction, but their backlogs have lined noticeably the last month so. Recent placements have en small, but the outlook is con- ered promising with extensive d and freeway projects pend- ; in Washington and adjacent tes involving large quantities of rs—the largest is the proposed ashington State Hood Canal ating bridge involving 6300 tons ids Oct. 15.

In the San Francisco market, mand for building bars has wed down with a drop in con- uction activity. One local area nt that depends heavily on re- orcing bar tonnage is operating about 34 per cent of capacity.

teel Bars . . .

Bar Prices, Page 165

At some points, demand for mer- ant bars continues disappoint- g. At others, an encouraging kup in orders is reported.

Eastern mills report hot-rolled r bookings are slightly heavier r October with deliveries rang- g two to four weeks. Cold-fin- ed users are buying small lots required, but they are not build- g inventories. Forging shops e not materially increasing their nnage for the fourth quarter.

Availability and prompt ship- nts on carbon bars continue to orten leadtime in New England. ld-finished is available from ck in a substantial range of es and grades. Hot rolled buy- g is slow, and while inventories e lower, converters' stocks of ld rolled tend to ease demand r replacement. Alloy bar de- and is dragging even more than at for carbon, but a slight in- ease in stainless bar buying for ctober-November is noted.

Predictions of improvement in r sales this month have failed to aterialize at Pittsburgh.

Wire . . .

Wire Prices, Pages 167 & 168

October wire demand is slow and spotty. Volume is only slightly ahead of that in September. Rod orders are light, with customers depending on inventories to a large extent.

Users of finished wire are buying close to their requirements. Requirements beyond a month-to-month basis are being placed in only a few instances.

Consumers aren't as optimistic as they were about the fourth quarter outlook for fasteners and high carbon steel springs. Competition with imported merchant wire products, notably nails, is sharp.

Automotive buying of wire items is a little heavier for October, but is in smaller volume than had been anticipated.

Rod buying for fourth quarter is slightly heavier in the East, the bulk of specifications being for

October shipment. For some months rod users have been drawing on inventory, and the mild increase points to more open gaps in stocks. The upturn in manufacturers wire and merchant products is slight.

Plates . . .

Plate Prices, Page 165

Demand for sheared plates is active, with November rolling schedules filling. Eastern shipyards, with heavier backlogs, are placing more plate tonnage. The Newport News Shipbuilding & Dry Dock Co. has a contract for a supercollier from the Pocahontas Steamship Co. It will be a self-unloading carrier with a cargo capacity of 24,000 tons.

Universal and strip plate buying in the East is easier. Most users of strip plate have built up stocks and are not pressing the mills for tonnage as they were some time ago.

Pittsburgh area producers think over-all demand for plates should be as strong in the fourth quarter as it has been in previous periods.

Tubular Goods . . .

Tubular Goods Prices, Page 171

Demand for steel pipe is up slightly in New England. Distributors' stocks are substantial and well balanced in the area. Only seamless pipe, 12 in. and larger, offers any procurement problem, and deliveries in this classification are improving.

Tubular goods stocks are backing up with utilities, and some seamless pipe shipments are being deferred.

Mechanical tubing is moving slowly, and some pipe sizes are being produced on tubing mills. Deliveries of stainless tubular goods are back to normal.

The city of Seattle soon will call for bids on cast iron pipe supplies for several local improvement districts. The total may approximate 2000 tons. Portland, Oreg., has placed an order for 500 tons of cast pipe. A contractor's job in Seattle involves 200 tons. Other potential cast business in the Pacific Northwest indicates an active fourth quarter in the area.

Oil country tube producers are taking orders from domestic users

shorter leadtimes than has been case in previous quarters. They certain of strong sales in Oc- er, but users have been plac- orders for only one month at ime instead of for an entire rter. Sales volume in Novem- and December, may decline, n the likelihod of a drop in the ky Mountain areas or in Can- due to seasonal conditions. es to southwestern oil producing as are firm. Export demand is vy.

ructural Shapes . . .

Structural Shape Prices, Page 165

tructural fabricating shops are e competitive for tonnage er than bridge work. They are mating on thinner margins.

n the East, shop backlogs con- ue substantial, but they are de- ing with fewer building and struction projects coming up estimates, notably industrial. Boston fabricators are operat- after a seven-week strike. Pro- tion costs in the area will be $10 to $12 a ton, including high- steel and labor charges. Shops this group formerly operated h a differential of 26 cents per r over other New England fab- ators, Connecticut excepted, and s margin is now widened.

A mild flurry in New England tracts includes 3000 tons for an urance office building, Mont- ier, Vt. Bridge estimating is htly heavier in the area for de- ery in mid-1958.

Pittsburgh area producers ex- t to have full order books in fourth quarter, bolstered by a ssible carryover of unfilled or- s for wide flange beams.

g Iron . . .

Pig Iron Prices, Page 172

Falling prices in the cast scrap rket continue to prompt some ndries to increase the use of ap in their melts, reducing their rchant iron requirements. There no tendency to stockpile iron winter because foundries be- ve supplies will be available en wanted at stable prices.

Foundries are not getting as ch business from the automo- e industry as they had counted for the fall season. Some are erating at less than a full week. e busiest are those making large

Anaconda Aluminum Coiled Sheet

ALUMINUM COILED SHEET produced to the high standards of quality and uniformity maintained by The American Brass Company is now available for prompt shipment from our Torrington Division to all points in the United States.

It is rolled on the most modern, high-speed equipment, X-ray controlled to close tolerance in gage. High-speed, electronically operated slitters give exact widths with clean edges on evenly and tightly wound coils. Latest annealing furnaces—with controlled atmosphere and temperature—provide high uniformity of metal structure to meet specified mechanical-property limits.

IN THESE WIDTHS: Maximum 28 inches
Minimum ⅜ inch

IN THESE THICKNESSES: Maximum 0.064 inch
Minimum .006 inch

COIL WEIGHTS: Up to 100 lb. per inch of width

ARBOR SIZES: 4, 6, 8, 10, 12, 16, and 20 inches in diameter

ALLOYS: 1100, 3003, 3004, 5005, 5050, 5052

TEMPERS: Alloy Nos. 1100, 3003, 5005
—O, —H12, —H14, —H16, —H18
Alloy Nos. 3004, 5005, 5050, 5052
—O, —H32, —H34, —H36, —H38

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ANACONDA®
ALUMINUM COILED SHEET
Made by The American Brass Company

lings for railroad equipment
eerns.
hipments to New England
ndries are slightly heavier,
ecting spotty improvement in
ring of castings in that dis-
t. Some melters permitted in-
tories to decline to the point
re additional iron is required
even a slight gain in orders.
tile mill equipment shops are
operating well under capacity,
some are booking job work.
he pig iron market in the St.
is district has been weakened
Canadian underselling.
last furnace "A" at the Ne-
Island (Pa.) Works of the
sburgh Coke & Chemical Co.
blown in Sept. 11 after com-
e relining and installation of
equipment. It has been
pted to permit production of
ndard ferromanganese in addi-
to pig iron. The unit's
e capacity was increased 30
cent since ferromanganese re-
es higher blast heats than con-
tional pig iron. It has a daily
duction of 900 tons of pig iron.

on Ore . . .

Iron Ore Prices, Page 173

ewer American iron ore car-
s are operating on the Great
es than was the case a year
reports M. A. Hanna Co.,
veland. Of the 251 vessels in
fleet, 239, or 95.22 per cent,
e in commission on Sept. 15.
t compares with 249 in opera-
a month ago, or 99.20 per

year ago, the entire American
e ore fleet was in operation. In
trast, 12 ships are now laid up
the remainder of the season.
y include eight vessels of the
rlake Steamship Co.'s fleet,
of the Columbia Transporta-
Co.'s fleet, and two of Beth-
em Transportation Co.'s fleet.
hipments of lake ore in August
led 13,172,356 gross tons, ac-
ding to the Lake Carriers' As-
iation. This compares with 8,-
,028 tons in the like month last
r.
hipments of Lake Superior iron
in the week ended Sept. 16
aled 2,801,417 gross tons, re-
ts the American Iron Ore Asso-
ion. Comparison: 3,182,818
ss tons in the like week of 1956.

Cumulative shipments through Sept. 16 amount to 63,791,478 tons, an increase of 15,670,416 tons, compared with 48,121,062 tons moved in the like period of the 1956 season.

Steel Ingot Production—August, 1957

Period	— OPEN HEARTH— Net tons	Per cent of capacity	——BESSEMER—— Net tons	Per cent of capacity	——ELECTRIC—— Net tons	Per cent of capacity	———TOTAL——— Net tons	Per cent of capacity
1957								
January ..	9,829,691	99.0	294,839	77.1	884,232	86.5	11,008,762	97.1
February .	8,898,671	99.2	277,682	80.4	810,853	87.8	9,987,206	97.6
March	9,442,164	95.1	275,156	71.9	871,754	85.2	10,589,074	93.4
1st Qtr. ..	28,170,526	97.7	847,677	76.3	2,566,839	86.4	31,585,042	96.0
April	8,820,328	91.8	231,731	62.6	762,721	77.1	9,814,780	89.5
May	8,842,707	89.1	201,864	52.8	747,752	73.1	9,792,323	86.4
June	8,498,903	88.4	210,915	57.0	681,584	68.9	9,391,402	85.6
2nd Qtr. ..	26,161,938	89.8	644,510	57.4	2,192,057	73.0	28,998,505	87.2
1st 6 Mo..	54,332,464	93.7	1,492,187	66.8	4,758,896	79.7	60,583,547	91.5
*July	8,086,519	81.4	194,638	50.9	627,575	61.4	8,908,732	78.6
‡August ..	8,289,000	83.5	205,000	53.6	724,000	70.8	9,218,000	81.3
1956								
January ..	9,676,151	101.4	323,235	79.5	828,845	86.7	10,828,231	99.3
February .	9,043,064	101.3	296,543	78.0	799,388	87.1	10,118,995	99.2
March	9,795,263	102.7	310,060	76.3	819,465	85.7	10,924,788	100.2
1st Qtr. ..	28,514,478	101.8	929,838	77.9	2,427,698	86.5	31,872,014	99.6
April	9,437,945	102.2	306,388	77.9	779,452	84.2	10,523,785	99.7
May	9,370,167	98.2	297,990	73.3	822,219	86.0	10,490,376	96.2
June	8,664,605	93.9	282,846	71.9	773,546	83.6	9,720,997	92.1
2nd Qtr. ..	27,472,717	98.1	887,224	74.3	2,375,217	84.6	30,735,158	96.0
1st 6 Mo. .	55,987,195	100.0	1,817,062	76.1	4,802,915	85.6	62,607,172	97.8
July	1,330,151	13.9	.....	....	292,012	30.5	1,622,163	14.9
August ...	7,213,274	75.6	189,564	46.6	719,759	75.3	8,122,597	74.5
September..	9,342,796	101.2	286,978	72.9	792,885	85.7	10,422,659	98.8
3rd Qtr. ..	17,886,221	63.2	476,542	39.5	1,804,656	63.6	20,167,419	62.3
9 Mo.	73,873,416	87.6	2,293,604	63.8	6,607,571	78.2	82,774,591	85.9
October ...	9,841,002	103.2	330,101	81.2	877,410	91.8	11,048,513	101.3
November .	9,430,248	102.2	295,827	75.2	829,425	89.6	10,555,500	100.0
December .	9,695,919	101.6	308,465	75.9	833,161	87.1	10,837,545	99.4
4th Qtr. ..	28,967,169	102.3	934,393	77.4	2,539,996	89.5	32,441,558	100.3
2nd 6 Mo..	46,853,390	82.8	1,410,935	58.5	4,344,652	76.5	52,608,977	81.3
Total 1956	102,840,585	91.6	3,227,997	67.4	9,147,567	81.2	115,216,149	89.8

Note—The percentages of capacity operated in 1957 are calculated on Jan. 1, 1957, annual capacities of: Open hearth, 116,912,410 net tons; bessemer, 4,505,000 net tons; electric, 12,041,740 net tons; total, 133,459,150 net tons. The percentages of capacity operated in 1956 are calculated on Jan. 1, 1956, annual capacities of: Open hearth, 112,317,040 net tons; bessemer, 4,787,000 net tons; electric, 11,259,050 net tons; total, 128,363,090 net tons.
*Revised. †Preliminary figures, subject to revision.

Ferroalloys . . .

Fluorspar Prices, Page 173

Prices for Simplex low carbon ferrochrome will be raised 2 cents a pound on Oct. 1 by the Electro Metallurgical Co. The increase applies across the board to all grades regular and nitrogen bearing, and to all sizes and quantities. The new base price for the maximum 0.025 per cent grade is $0.3675 per pound of contained chromium, and for the maximum 0.010 per cent carbon grade, $0.3775.

Semifinished Steel . . .

Semifinished Prices, Page 165

Nearly one week's output of steel was lost by Youngstown Sheet & Tube Co. when 200 shopworkers—machinists, electricians, and carpenters—walked out in an unauthorized strike Sept. 11, forcing the company to close its Indiana Harbor and South Chicago plants for five days, idling 12,000 workmen.

Steel Output Sets Record

Production of steel set a record in the first eight months this year, reports the American Iron & Steel Institute. Total output was 78,710,279 net tons, compared with the previous record of 76.6 million tons in the first eight months of 1953.

Output in the like period of last year was only 72.3 million tons, but production in the period was adversely affected by the steel strike during July.

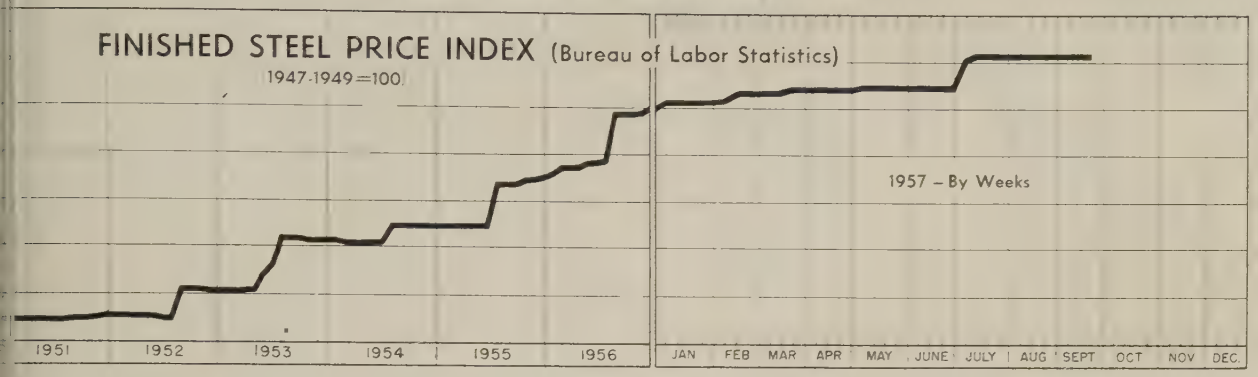
Operations averaged 88.6 per cent in the first eight months, based on ingot capacity of 133,459,150 net tons annually as of Jan. 1.

August output totaled 9,218,000 net tons, compared with 8,908,732 in July, and with 8,122,597 in August a year ago.

During the month, steelmaking furnaces operated at an average of 81.3 per cent of capacity, compared with 78.6 per cent in July.

The index of production (1947-49 equals 100) during August was 129.6 against 125.2 in July. The index for the first eight months was 141.1 against 129.2 in the like period of 1956.

Price Indexes and Composites



Sept. 17, 1957	Week Ago	Month Ago	Aug. Avg.	Year Ago
181.5	181.5	181.5	181.5	168.6

AGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Sept. 17

include mill base prices and typical extras and deductions. Units lb except where otherwise noted in parentheses. For complete ion of the following products and extras and deductions ap- to them, write to STEEL.

Standard, No. 1...	$5.600	Bars, Reinforcing	6.210
Light, 40 lb	7.067	Bars, C.F., Carbon	10.360
...tes	6.600	Bars, C.F., Alloy	13.875
Railway	9.825	Bars, C.F., Stainless, 302 (lb)	0.553
Freight Car, 33 per wheel)	60.000	Sheets, H.R., Carbon	6.192
Carbon	6.150	Sheets, C.R., Carbon	7.089
...ral Shapes	5.942	Sheets, Galvanized	8.220
Tool Steel, Carbon	0.480	Sheets, C.R., Stainless, 302 (lb)	0.688
...ool Steel, Alloy, Oil ...ening Die (lb) ...	0.585	Sheets, Electrical	12.025
Tool Steel, H.R., , High Speed, W Cr 4.5, V 2.1, Mo ...C 0.60 (lb)	1.274	Strip, C.R., Carbon	9.243
		Strip, C.R., Stainless, 430 (lb)	0.493
		Strip, H.R., Carbon	6.245
		Pipe, Black, Buttweld (100 ft)	19.814
Tool Steel, H.R., , High Speed, W18, V 1 (lb)	1.769	Pipe, Galv., Buttweld (100 ft)	23.264
...I.R., Alloy	10.525	Pipe, Line (100 ft)	199.023
...I.R., Stainless, 303	0.525	Casing, Oil Well, Carbon (100 ft)	194.499
...H.R., Carbon	6.425	Casing, Oil Well, Alloy (100 ft)	304.610
		Tubes, Boiler (100 ft) ..	49.130
		Tubing, Mechanical, Carbon (100 ft)	24.953
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)....	9.783
		Tin Plate, Electrolytic 0.25 lb (95 lb base box)	8.483
		Black Plate, Canmaking Quality (95 lb base box)	7.583
		Wire, Drawn, Carbon ...	10.225
		Wire, Drawn, Stainless, 430 (lb)	0.653
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common.	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Sept. 18 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)...	239.15	239.15	239.15	225.71	181.40
Index in cents per lb	6.479	6.479	6.479	6.114	4.914

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$146.19	$146.19	$146.19	$137.75	$111.66
No. 2 Fdry Pig Iron, GT..	66.49	66.49	66.49	62.63	55.04
Basic Pig Iron, GT	65.99	65.99	65.99	62.18	54.66
Malleable Pig Iron, GT ...	67.27	67.27	67.27	63.41	55.77
Steelmaking Scrap, GT	48.17	50.17	53.50	59.67	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point

HED STEEL	Sept. 18 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
H.R., Pittsburgh	5.425	5.425	5.425	5.075	3.95
H.R., Chicago	5.425	5.425	5.425	5.075	3.95
I.R., deld., Philadelphia	5.725	5.725	5.715	4.93	4.502
C.F., Pittsburgh	7.30*	7.30*	7.30*	6.85*	4.925
Std., Pittsburgh ...	5.275	5.275	5.275	5.00	3.85
Std., Chicago	5.275	5.275	5.275	5.00	3.85
deld., Philadelphia..	5.545	5.545	5.525	5.00	4.13
Pittsburgh	5.10	5.10	5.10	4.85	3.90
Chicago	5.10	5.10	5.10	4.85	3.90
Coatesville, Pa.	5.50	5.50	5.50	5.25	4.35
Sparrows Point, Md.	5.10	5.10	5.10	4.85	3.90
Claymont, Del.	5.70	5.70	5.70	5.35	4.35
H.R., Pittsburgh ...	4.925	4.925	4.925	4.675	3.775
H.R., Chicago	4.925	4.925	4.925	4.675	3.775
C.R., Pittsburgh ...	6.05	6.05	6.05	5.75	4.575
C.R., Chicago	6.05	6.05	6.05	5.75	4.575
C.R., Detroit	6.05-6.15	6.05-6.15	6.05-6.15	5.75-5.85	4.775
Galv., Pittsburgh ..	6.60	6.60	6.60	6.30	5.075
H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.75-4.00
H.R., Chicago	4.925	4.925	4.925	4.675	3.725
C.R., Pittsburgh	7.15	7.15	7.15	6.85	5.10-5.80
C.R., Chicago	7.15	7.15	7.15	6.85	5.35
C.R., Detroit	7.25	7.25	7.25	6.95	5.30-6.05
Basic, Pittsburgh ...	7.65	7.65	7.65	7.20	5.10-5.225
Wire, Pittsburgh	8.95	8.95	8.95	8.35	5.90-6.35
te (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$9.85	$8.95

uding 0.35c for special quality.

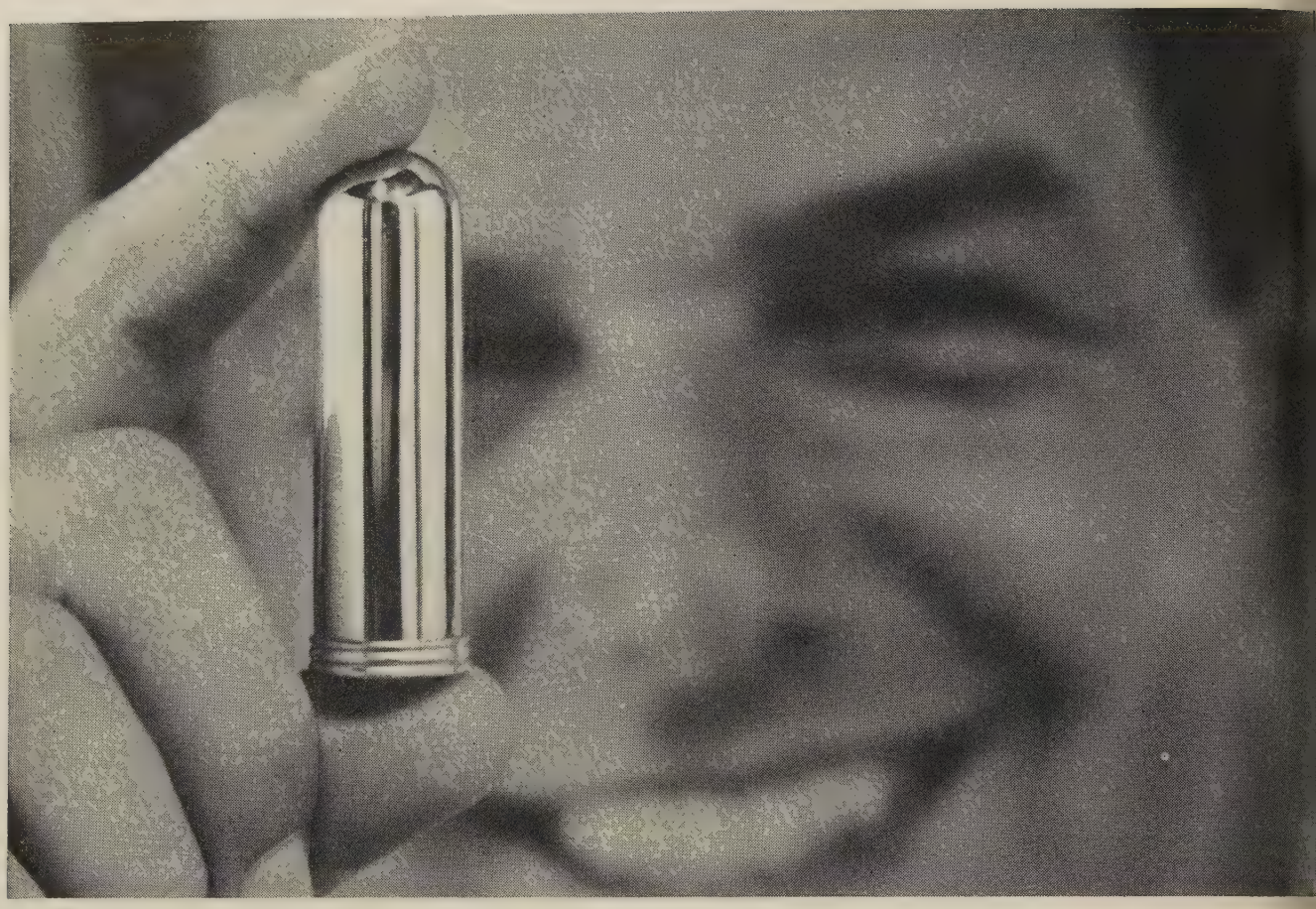
INISHED STEEL					
forging, Pitts. (NT)	$96.00	$96.00	$96.00	$91.50	$70.50
ods, ⅞-5⅝" Pitts. ...	6.15	6.15	6.15	5.80	4.325

PIG IRON, Gross Ton	Sept. 18 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts	$67.00	$67.00	$67.00	$63.50	$55.50
Basic, Valley	66.00	66.00	66.00	62.50	54.50
Basic, deld., Phila.	70.01	70.01	69.88	66.26	59.25
No. 2 Fdry, NevilleIsland,Pa	66.50	66.50	66.50	63.00	55.00
No. 2 Fdry, Chicago	66.50	66.50	66.50	63.00	55.00
No. 2 Fdry, deld., Phila. .	70.51	70.51	70.38	66.76	59.75
No. 2 Fdry, Birm.	62.50	62.50	62.50	59.00	51.38
No. 2 Fdry(Birm.)deld. Cin.	70.20	70.20	70.20	66.70	58.93
Malleable, Valley	66.50	66.50	66.50	63.00	55.00
Malleable, Chicago	66.50	66.50	66.50	63.00	55.00
Ferromanganese, Duquesne.	255.00†	255.00†	255.00†	215.00†	228.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$49.50	$51.50	$55.50	$58.50	$44.00
No. 1 Heavy Melt, E. Pa. ..	45.50	48.00	52.00	59.00	41.50
No. 1 Heavy Melt, Chicago.	49.50	51.00	53.00	61.50	42.50
No. 1 Heavy Melt, Valley..	51.50	52.50	55.50	65.50	44.00
No. 1 Heavy Melt, Cleve. ..	48.50	49.50	52.50	63.00	43.00
No. 1 Heavy Melt, Buffalo.	47.50	47.50	49.50	56.50	43.00
Rails, Rerolling, Chicago ..	64.50	65.50	74.50	84.50	52.50
No. 1 Cast, Chicago	44.50	44.50	46.50	53.50	50.00

COKE, Net Ton					
Beehive, Furn., Connlsvl. ..	$15.25	$15.25	$15.25	$14.50	$14.75
Beehive, Fdry., Connlsvl. ..	18.25	18.25	18.25	17.50	17.00



This part finished better, cost less when degreased with NIALK® TRICHLORethylene

What do you do when a part that's supposed to be bright and glossy comes out of the vapor degreaser dull—tarnished—unacceptable for finishing?

This was the problem facing The Plume & Atwood Mfg. Co., Thomaston, Conn.

Plume & Atwood manufactures pen caps, pen barrels and lipstick cases by the million to their exceptionally rigid quality specifications. But the high luster buffed into these parts was being lost in the degreaser. Tarnished spots suddenly started to show up, making a good coating job impossible.

(This is a fairly common problem in vapor degreasing. It's caused by the solvent you use turning acid. Solvent can go sour rapidly—unless it's protected by a neutral stabilizer that doesn't lose strength.)

Plume & Atwood tried several different conventional degreasing solvents, without success. Results were "inconsistent"; solvent life was much too short. To keep the bath from going sour, P and A had to dump and clean out the degreaser *every three weeks.*

Solved...with NIALK

Then P and A switched to NIALK TRICHLORethylene. Result: immediate improvement. The first charge of NIALK solvent functioned without trouble for *nine weeks.*

There's no telling how much longer this charge would have continued in service, for at this point P and A installed newer degreasing equipment. Since then, NIALK TRICHLORethylene *has remained in service more than six months without once going sour.*

As a result, P and A feels that the tarnish problem is solved for good. Parts now come out of the degreaser untarnished and immediately ready for further processing.

"We're getting considerably better solvent mileage," says John Bradford, P and A's assistant to the plant manager, "and much improved gloss and luster at lower cost—thanks to NIALK!"

Only NIALK has psp

This example shows why you get *more effective, lower-cost* degreasing when you use NIALK TRICHLORethylene with **psp**—*permanent staying power.*

You *never* have to replenish the neutralizer in NIALK. Even after many distillations, it's still there—working to prevent acid formation and other causes of breakdown. You go much longer, and degrease many more parts, between cleanouts. Cleanouts are easier, too, because NIALK actively retards the formation of degradation products in your degreaser.

For better degreasing, do this

See for yourself how you can keep your degreasers operating efficiently with NIALK—long after other solvents have lost their punch. Write us today on your business letterhead for the complete facts, including a resume of comparative metallurgical tests on five leading brands.

HOOKER ELECTROCHEMICAL COMPANY
1209 Union Street, Niagara Falls, N. Y.

HOOKER CHEMICALS PLASTICS

DUREZ® PLASTICS DIVISION • NORTH TONAWANDA, N. Y.
NIALK® CHEMICALS • NIAGARA FALLS, N. Y.
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Sales Offices: Chicago, Ill.; Detroit, Mich.; Los Angeles, Calif.; New York, N. Y.; Niagara Falls, N. Y.; Philadelphia, Pa.; Tacoma, Wash.; N. Tonawanda, N. Y.; Worcester, Mass. *In Canada:* Hooker Chemicals Limited, N. Vancouver, B. C.

el Prices

Mill prices as reported to STEEL, Sept. 18, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 166; to footnotes, page 168.

EMIFINISHED

S, Carbon, Forging (NT)

all,Pa. U5 .....$73.50

S, Alloy (NT)

t S41 .....$77.00
ll,Pa. S3 .....77.00
lville,O. S3 .....77.00
nd,Pa. C18 .....77.00
all,Pa. U5 .....77.00
n,Pa. S3 .....77.00

S, BLOOMS & SLABS

rbon, Rerolling (NT)

gner,Pa. U5 ....$77.50
eport,Conn. N19 ..80.50
lo R2 .....77.50
on,Pa. U5 .....77.50
y,Ala. T2 .....77.50
eld,Ala. T2 .....77.50
na,Calif. K1 ....88.00
and. U5 .....77.50
ktown,Pa. B2 ....77.50
awanna,N.Y. B2 ..77.50
all,Pa. U5 .....77.50
cago,Ill. R2, U5 ..77.50
quesne,Pa. U5 ....77.50
ag,Ill. N15 .....77.50
nstown R2 .....77.50

arbon, Forging (NT)

gner,Pa. U5 .....$96.00
eport,Conn. N19 .101.00
lo R2 .....96.00
on,O. R2 .....98.50
on,Pa. U5 .....96.00
ohocken,Pa. A3 .101.00
y,Ala. T2 .....96.00
eld,Ala. T2 .....96.00
na,Calif. K1 ....105.50
and. U5 .....96.00
a,Utah C11 .....96.00
on S5 .....101.00
ktown,Pa. B2 ....96.00
awanna,N.Y. B2 ..96.00
ngeles B3 .....105.50
and,Pa. C18 .....96.00
all,Pa. U5 .....96.00
e B3 .....109.50
on,Pa. S3 .....96.00
cago R2,U5,W14 ..96.00
quesne,Pa. U5 ....96.00
Francisco B3 ....105.50
on,O. C17 .....96.00

Alloy, Forging (NT)

hem,Pa. B2 ...$114.00
eport,Conn. N19.114.00
lo R2 .....114.00
on,O. R2, T7 ....114.00
ohocken,Pa. A3..121.00
eit S41 .....114.00
my,Pa. B14 .....114.00
ll,Pa. S3 .....114.00
na,Calif. K1 ....135.00
and. U5 .....114.00
on S5 .....119.00
arbor,Ind. Y1 ..114.00
ktown,Pa. B2 ....114.00
awanna,N.Y. B2 .114.00
ngeles B3 .....134.00
lville,O. S3 .....114.00
llon,O. R2 .....114.00
nd,Pa. C18 .....114.00
all,Pa. U5 .....114.00
on,Pa. S3 .....114.00
cago R2,U5,W14..114.00
quesne,Pa. U5 ....114.00
ers,O. Y1 .....114.00
on,O. C17 .....114.00

DS, SEAMLESS TUBE (NT)

eport,Conn. N19 $122.50
lo R2 .....117.50
on,O. R2 .....120.00
land.O. R2 .....117.50
and. U5 .....117.50
cago,Ill. R2, W14 117.50
quesne,Pa. U5 ...117.50
on,O. C17 .....117.50

ppa,Pa. J5 .....5.075
all,Pa. U5 .....4.875
on,O. R2 .....4.875
gstown R2, U5 ..4.875

RODS

maCity,Ala. R2 ..6.15
ppa.Pa. J5 .....6.15
Ill. L1 .....6.35
lo W12 .....6.15
land A7 .....6.15
ca.Pa. A7 .....6.15
eld.Ala. T2 .....6.15
on S5 .....6.40
naHarbor,Ind. Y1..6.15
ktown,Pa. B2 ....6.15
.Ill. A7 .....6.15
asCity,Mo. S5 ....6.40
mo,Ind. C16 .....6.25
ngeles B3 .....6.95
equa,Colo. C10 ....6.40

Monessen,Pa. P17 .....6.15
N.Tonawanda,N.Y. B11..6.15
Pittsburg,Calif. C11 ....6.95
Portsmouth,O. P12 .....6.15
Roebling,N.J. R5 .....6.25
S.Chicago,Ill. R2 .....6.15
SparrowsPoint,Md. B2 ..6.25
Sterling,Ill.(1) N15 ....6.15
Sterling,Ill. N15 .....6.25
Struthers,O. Y1 .....6.15
Worcester,Mass. A7 ....6.45

STRUCTURALS

Carbon Steel Std. Shapes

Ala.City,Ala. R2 .....5.275
Atlanta A11 .....5.475
Aliquippa,Pa. J5 .....5.275
Bessemer,Ala. T2 .....5.275
Bethlehem,Pa. B2 .....5.325
Birmingham C15 .....5.275
Clairton,Pa. U5 .....5.275
Fairfield,Ala. T2 .....5.275
Fontana,Calif. K1 .....6.075
Gary,Ind. U5 .....5.275
Geneva,Utah C11 .....5.275
Houston S5 .....5.375
Ind.Harbor,Ind. I-2 ...5.275
Johnstown,Pa. B2 ....5.325
Joliet,Ill. P22 .....5.275
KansasCity,Mo. S5 ....5.375
Lackawanna,N.Y. B2..5.325
LosAngeles B3 .....5.975
Minnequa,Colo. C10 ...5.575
Munhall,Pa. U5 .....5.275
Niles,Calif. P1 .....5.925
Phoenixville,Pa. P4 ....5.50
Portland,Oreg. O4 ....6.025
Seattle B3 .....6.025
S.Chicago,Ill. U5, W14..5.275
S.SanFrancisco B3 ....5.925
Sterling,Ill. N15 .....5.275
Torrance,Calif. C11 ...5.975
Weirton,W.Va. W6 ....5.275

Wide Flange

Bethlehem,Pa. B2 .....5.325
Clairton,Pa. U5 .....5.275
Fontana,Calif. K1 ....6.225
IndianaHarbor,Ind. I-2.5.525
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 .....5.275
Phoenixville,Pa. P4 ....5.50
S.Chicago,Ill. U5 .....5.275

Alloy Std. Shapes

Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.65
KansasCity,Mo. S5 .....6.65
Munhall,Pa. U5 .....6.55
S.Chicago,Ill. U5 .....6.55

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5 .....7.75
Bessemer,Ala. T2 .....7.75
Bethlehem,Pa. B2 .....7.80
Clairton,Pa. U5 .....7.75
Fairfield,Ala. T2 .....7.75
Fontana,Calif. K1 .....8.55
Gary,Ind. U5 .....7.75
Geneva,Utah C11 .....7.75
Houston S5 .....7.85
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 .....7.80
KansasCity,Mo. S5 .....7.85
Lackawanna,N.Y. B2 ..7.80
LosAngeles B3 .....8.45
Munhall,Pa. U5 .....7.75
Seattle B3 .....8.50
S.Chicago,Ill. U5, W14..7.75
S.SanFrancisco B3 .....8.40
Struthers,O. Y1 .....7.75

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....7.80
Lackawanna,N.Y. B2 ..7.80
Munhall,Pa. U5 .....7.75
S.Chicago,Ill. U5 .....7.75

PILING

BEARING PILES

Bethlehem,Pa. B2 .....5.325
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 .....5.275
S.Chicago,Ill. U5 .....5.275

STEEL SHEET PILING

Lackawanna,N.Y. B2 ..6.225
Munhall,Pa. U5 .....6.225
S.Chicago,Ill. U5 .....6.225

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(15) A10 ...5.10
Bessemer,Ala. T2 .....5.10
Clairton,Pa. U5 .....5.10
Claymont,Del. C22 .....5.70
Cleveland J5, R2 .....5.20
Coatesville,Pa. L7 .....5.50
Conshohocken,Pa. A3 ..5.20
Ecorse,Mich. G5 .....5.20
Fairfield,Ala. T2 .....5.10
Fontana,Calif.(30) K1 ..5.90
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.10
GraniteCity,Ill. G4 .....5.30
Harrisburg,Pa. P4 .....5.80
Houston S5 .....5.20
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa. B2 .....5.10
Lackawanna,N.Y. B2 ..5.10
LoneStar,Tex. L6 .....5.45
Mansfield,O. E6 .....5.10
Minnequa,Colo. C10 ....5.95
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Pittsburgh J5 .....5.10
Riverdale,Ill. A1 .....5.10
Seattle B3 .....6.00
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Sterling,Ill. N15 .....5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Youngstown R2, U5, Y1..5.10

PLATES, Carbon Abras. Resist.

Claymont,Del. C22 .....7.35
Fontana,Calif. K1 .....7.55
Geneva,Utah C11 .....6.75
Johnstown,Pa. B2 .....7.00
SparrowsPoint,Md. B2 ..7.00

PLATES, Wrought Iron

Economy,Pa. B14 .....13.15

PLATES, H.S., L.A.

Aliquippa,Pa. J5 .....7.625
Bessemer,Ala. T2 .....7.625
Clairton,Pa. U5 .....7.625
Claymont,Del. C22 .....7.625
Cleveland J5, R2 .....7.625
Coatesville,Pa. L7 .....7.925
Conshohocken,Pa. A3 ..7.625
Economy,Pa. B14 .....7.625
Ecorse,Mich. G5 .....7.725
Fairfield,Ala. T2 .....7.625
Farrell,Pa. S3 .....7.625
Fontana,Calif.(30) K1..8.425
Gary,Ind. U5 .....7.625
Geneva,Utah C11 .....7.625
Houston S5 .....7.725
Ind.Harbor,Ind. I-2, Y1 7.625
Johnstown,Pa. B2 .....7.625
Lackawanna,N.Y. B2 ..7.625
Munhall,Pa. U5 .....7.625
Pittsburgh J5 .....7.625
Seattle B3 .....8.525
Sharon,Pa. S3 .....7.625
S.Chicago,Ill. U5, W14 7.625
SparrowsPoint,Md. B2..7.625
Warren,O. R2 .....7.625
Youngstown U5 .....7.625

PLATES, Alloy

Aliquippa,Pa. J5 .....7.20
Claymont,Del. C22 .....7.20
Coatesville,Pa. L7 .....7.20
Economy,Pa. B14 .....7.20
Farrell,Pa. S3 .....7.20
Fontana,Calif.(30) K1 ..8.00
Gary,Ind. U5 .....7.20
Houston S5 .....7.30
Ind.Harbor,Ind. Y1 ....7.20
Johnstown,Pa. B2 .....7.20
Lowellville,O. S3 .....7.20
Munhall,Pa. U5 .....7.20
Newport,Ky. A2 .....7.20
Pittsburgh J5 .....7.20
Seattle B3 .....8.10
Sharon,Pa. S3 .....7.20
S.Chicago,Ill. U5, W14..7.20
SparrowsPoint,Md. B2 ..7.20
Youngstown Y1 .....7.20

FLOOR PLATES

Cleveland J5 .....6.175
Conshohocken,Pa. A3 ..6.175
Ind.Harbor,Ind. I-2 ...6.175
Munhall,Pa. U5 .....6.175
S.Chicago,Ill. U5 .....6.175

PLATES, Ingot Iron

Ashland c.l. (15) A10...5.35
Ashland l.c.l. (15) A10..5.85
Cleveland c.l. R2 .....5.85
Warren,O. c.l. R2 .....5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)

Ala.City,Ala.(9) R2 ..5.425
Aliquippa,Pa.(9) J5 ....5.425
Alton Ill. L1 .....5.625
Atlanta(9) A11 .....5.625
Bessemer,Ala.(9) T2 ..5.425
Birmingham(9) C15 ...5.425
Bridgeport,Conn.(9) N19 5.65
Buffalo(9) R2 .....5.425
Clairton,Pa.(9) U5 ....5.425
Cleveland(9) R2 .....5.425
Ecorse,Mich.(9) G5 ...5.525
Emeryville,Calif. J7 ...6.175
Fairfield,Ala.(9) T2 ..5.425
Fairless,Pa.(9) U5 ....5.575
Fontana,Calif.(9) K1 ..6.125
Gary,Ind.(9) U5 .....5.425
Houston(9) S5 .....5.675
Ind.Harbor(9) I-2, Y1.5.425
Johnstown,Pa.(9) B2 ..5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
LosAngeles(9) B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
N.T'wanda,N.Y.(46)B11 5.775
Pittsburg,Calif.(9) C11.6.125
Pittsburgh(9) J5 .....5.425
Portland,Oreg. O4 .....6.175
Seattle B3, N14 .....6.175
S.Ch'c'go(9)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5..5.425
S.SanFran.,Calif.(9)B3 6.175
Sterling,Ill.(1)(9) N15..5.425
Sterling,Ill.(9) N15 ....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..5.425
Torrance,Calif.(9) C11.6.125
Youngstown(9) R2, U5.5.425

BARS, H.R. Leaded Alloy (Including leaded extra)

Warren,O. C17 .....7.475

BARS, Hot-Rolled Alloy

Aliquippa,Pa. J5 .....6.475
Bethlehem,Pa. B2 .....6.475
Bridgeport,Conn. N19 ..6.55
Buffalo R2 .....6.475
Canton,O. R2, T7 .....6.475
Clairton,Pa. U5 .....6.475
Detroit S41 .....6.475
Economy,Pa. B14 .....6.475
Ecorse,Mich. G5 .....6.575
Fairless,Pa. U5 .....6.625
Farrell,Pa. S3 .....6.475
Fontana,Calif. K1 ....7.525
Gary,Ind. U5 .....6.475
Houston S5 .....6.725
Ind.Harbor,Ind. I-2, Y1 6.475
Johnstown,Pa. B2 ....6.475
KansasCity,Mo. S5 ....6.725
Lackawanna,N.Y. B2 ..6.475
Lowellville,O. S3 .....6.475
LosAngeles B3 .....7.525
Massillon,O. R2 .....6.475
Midland,Pa. C18 .....6.475
Pittsburgh J5 .....6.475
Sharon,Pa. S3 .....6.475
S.Chicago R2, U5, W14 6.475
S.Duquesne,Pa. U5 ....6.475
Struthers,O. Y1 .....6.475
Warren,O. C17 .....6.475
Youngstown U5 .....6.475

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 .....7.925
Bessemer,Ala. T2 ....7.925
Bethlehem,Pa. B2 .....7.925
Bridgeport,Conn. N19 ..7.95
Clairton,Pa. U5 .....7.925
Cleveland R2 .....7.925
Ecorse,Mich. G5 .....8.025
Fairfield,Ala. T2 .....7.925
Fontana,Calif. K1 ....8.625
Gary,Ind. U5 .....7.925
Houston S5 .....8.175
Ind.Harbor,Ind. Y1 ....7.925
Johnstown,Pa. B2 .....7.925
KansasCity,Mo. S5 ....8.175
Lackawanna,N.Y. B2..7.925
LosAngeles B3 .....8.625
Pittsburgh J5 .....7.925
Seattle B3 .....8.675
S.Chicago,Ill. U5, W14 7.925
S.Duquesne,Pa. U5 ....7.925
S.SanFrancisco B3 ....8.675
Struthers,O. Y1 .....7.925
Youngstown U5 .....7.925

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa.(9) B2 ..5.575
Houston(9) S5 .....5.675
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
Sterling,Ill. N15 .....5.525
Sterling,Ill.(1) N15 ..5.425
Tonawanda,N.Y. B12 ..5.425

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....5.425
Atlanta A11 .....5.625
Joliet Ill. P22 .....5.425
Niles,Calif. P1 .....6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SanFrancisco S7 .....6.275
Seattle B3 .....6.175

BAR SHAPES, Hot-Rolled Alloy

Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.80
KansasCity,Mo. S5 ....6.80
Pittsburgh J5 .....6.55
Youngstown U5 .....6.55

BARS, C.F., Leaded Alloy (Including leaded extra)

Ambridge,Pa. W18 ...9.925
BeaverFalls,Pa. M12 ..9.925
Camden,N.J. P13 ....10.10
Chicago W18 .....9.925
Cleveland C20 .....9.925
LosAngeles P2, S30
(Grade A) 11.30
(Grade B) 11.80
Monaca,Pa. S17 .....9.925
Newark,N.J. W18 ....10.10
SpringCity,Pa. K3 ....10.10
Warren,O. C17 .....9.925

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....7.30
BeaverFalls,Pa. M12,R2 7.30
Birmingham C15 .....7.90
Bridgeport,Conn. N19 ..7.65
Buffalo B5 .....7.35
Camden,N.J. P13 .....7.75
Carnegie,Pa. C12 .....7.30
Chicago W18 .....7.30
Cleveland A7, C20 ....7.30
Detroit B5, P17 .....7.50
Detroit S41 .....7.30
Donora,Pa. A7 .....7.30
Elyria,O. W8 .....7.30
FranklinPark,Ill. N5 ..7.30
Gary,Ind. R2 .....7.30
GreenBay,Wis. F7 .....7.30
Hammond,Ind. J5, L2 ..7.30
Hartford,Conn. R2 .....7.80
Harvey,Ill. B5 .....7.30
LosAngeles P2, S30 ....8.75
LosAngeles R2 .....8.75
Mansfield,Mass. B5 ....7.85
Massillon,O. R2, R8 ....7.30
Midland,Pa. C18 .....7.30
Monaca,Pa. S17 .....7.30
Newark,N.J. W18 .....7.75
NewCastle,Pa.(17) B4 ..7.30
Pittsburgh J5 .....7.30
Plymouth,Mich. P5 ....7.55
Putnam,Conn. W18 ....7.85
Readville,Mass. C14 ..7.85
S.Chicago,Ill. W14 .....7.30
SpringCity,Pa. K3 .....7.75
Struthers,O. Y1 .....7.30
Warren,O. C17 .....7.30
Willimantic,Conn. J5 ...7.80
Waukegan,Ill. A7 .....7.30
Youngstown F3, Y1 ....7.30

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19.6.55

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....8.775
BeaverFalls,Pa.M12,R2 8.775
Bethlehem,Pa. B2 ....8.775
Bridgeport,Conn. N19 ..8.925
Buffalo B5 .....8.775
Camden,N.J. P13 .....8.95
Canton,O. T7 .....8.775
Carnegie,Pa. C12 .....8.775
Chicago W18 .....8.775
Cleveland A7, C20 ....8.775
Detroit B5, P17 .....8.975
Detroit S41 .....8.775
Donora,Pa. A7 .....8.775
Elyria,O. W8 .....8.775
FranklinPark,Ill. N5 ..8.775
Gary,Ind. R2 .....8.775
GreenBay,Wis. F7 .....8.775
Hammond,Ind. J5, L2..8.775
Hartford,Conn. R2 ....9.075
Harvey,Ill. B5 .....8.775
Lackawanna,N.Y. B2 ..8.775
LosAngeles P2, S30 ...10.65
Mansfield,Mass. B5 ...9.075
Massillon,O. R2, R8 ..8.775
Midland,Pa. C18 .....8.775
Monaca,Pa. S17 .....8.775
Newark,N.J. W18 .....8.95
Plymouth,Mich. P5 ...8.975
S.Chicago W14 .....8.775
SpringCity,Pa. K3 .....8.95
Struthers,O. Y1 .....8.775
Warren,O. C17 .....8.775
Waukegan,Ill. A7 ....8.775
Worcester,Mass. A7 ...9.075
Youngstown F3, Y1 ..8.775

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....5.425
Atlanta A11 .....5.625
Birmingham C15, S42 ..5.425
Bridgeport,Conn. N19 ...5.65
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.775
Emeryville,Calif. J7 ..6.175
Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 ....6.125
Ft.Worth,Tex.(4)(26)T4 5.875
Gary, Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2,Y1 5.425
Johnstown,Pa. B2 ....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 ....5.675
Lackawanna,N.Y. B2 ..5.425
LosAngeles B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ...6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 ....6.175
SparrowsPoint,Md. B2..5.425
Sterling,Ill.(1) N15 ...5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ...6.00
Torrance,Calif. C11 ....6.125
Youngstown R2, U5 ..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2 .....7.56
Chicago U8 .....6.91
Cleveland U8 .....6.89
Johnstown,Pa. B2 .....7.08
KansasCity,Mo. S5 .....7.35
Lackawanna,N.Y. B2 ..6.85
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.55
Pittsburgh J5, U8 ....7.10
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ....7.08
Williamsport,Pa. S19 ..7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy(Staybolt)B14 18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2.5.325
ChicagoHts.(4)(44) I-2.5.425
ChicagoHts.(4) C2 ....5.425
Ft.Worth,Tex.(26) T4..5.875
Franklin,Pa. (3) F5 ..5.325
Franklin,Pa.(4) F5 ...5.425
JerseyShore,Pa.(3) J8 ..5.30
Marion,O.(3) P11 .....5.325
Tonawanda(3) R12 ....5.325
Tonawanda (4) B12 ....6.00
Williamsport,Pa. (3)S19 5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.925
Allenport,Pa. P7 .....4.925
Ashland,Ky.(8) A10....4.925
Cleveland J5, R2 ....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 ....4.925
Fairless. Pa. U5 .....4.975
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....4.925
Geneva,Utah C11 ....5.025
Granite City,Ill.(8) G4. 5.125
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 ..4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ..4.925
Niles,O. M21, S3 ....4.925
Pittsburg,Calif. C11 ..5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 .....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill. W14 ....4.925
SparrowsPoint,Md. B2..4.925
Steubenville,O. W10 ...4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ...4.925
Youngstown U5, Y1..4.925

SHEETS, H.R., (19 Ga. & Lighter)

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ....8.10

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 ....7.275
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.375
Fairfield,Ala. T2 ....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 .....8.175
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2, Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna (35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5, W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2..7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ....7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.05
Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ..6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ...6.05
Fontana, Calif. K1 ....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 .....6.25
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 ....7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 ....6.05
SparrowsPoint,Md. B2 ..6.05
Steubenville,O. W10 ....6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville, O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 ....8.975
Ecorse, Mich. G5 .....9.075
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ....10.275
Gary, Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna (37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint (38) B2 8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert	Cu Steel	Cu Fe
Ashland,Ky. A10	.6.95	7.20
Canton,O. R2	....6.95	7.45
Fairfield T2	....6.95	7.20
Gary,Ind. U5	....6.95	7.20
GraniteCity,Ill. G4	7.15	...
Ind.Harbor I-2	...6.95	7.20
Irvin,Pa. U5	.....6.95	7.20
Kokomo,Ind. C16	..7.05	...
MartinsFry. W10	.6.95	7.20
Pitts.,Calif. C11	..7.70	...
Pittsburgh J5	....6.95	...
SparrowsPt. B2	..6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 .. 7.20

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....6.60‡
Ashland,Ky. A10 ....6.60†
Canton,O. R2 .....6.60‡
Dover,O. R1 .....6.60†
Fairfield,Ala. T2 .....6.60†
Gary,Ind. U5 .....6.60*
GraniteCity,Ill. G4 ....6.80*
Ind.Harbor,Ind. I-2 ...6.60†
Irvin,Pa. U5 .....6.60*
Kokomo,Ind. C16 .....6.70‡
MartinsFerry,O. W10 ..6.60*
Middletown,O. A10 ...6.60†
Pittsburg,Calif. C11 ..7.35*
Pittsburgh J5 .....6.60†
SparrowsPt.,Md. B2 ...6.60†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 ....6.60*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.3

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.7
SparrowsPt.(39) B2 ...9.7

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.
Irvin,Pa. U5 .....7.

SHEETS, Galvanized Ingot Iro (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.
Middletown,O. A10 ....6.

SHEETS, Electrogalvanized

Cleveland (28) R2 ....7.42
Niles,O.(28) R2 .....7.42
Weirton,W.Va. W6 ...7.27

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1).9.2
Butler,Pa. A10 (type 2).9.3

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.62
Cleveland R2 .....6.62
Gary,Ind. U5 .....6.62
GraniteCity,Ill. G4 ....6.82
Ind.Harbor,Ind. I-2,Y1 6.62
Irvin,Pa. U5 .....6.62
Middletown,O. A10 ....6.82
Niles,O. M21, S3 .....6.62
Youngstown Y1 .....6.62

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...8.8
Ind.Harbor,Ind. I-2 ...8.47
Yorkville,O. W10 .....8.47

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.0
Gary,Ind. U5 .....7.0
Mansfield,O. E6 .....7.0
Middletown,O. A10 ....7.0
Niles,O. M21, S3 .....7.0
Warren,O. R2 .....7.0
Weirton,W.Va. W6 ....7.0

SHEETS, Long Terne, Ingot Iro

Middletown,O. A10 .....7.4

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allengheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calmuet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve.Cold Rolling Mills
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymount Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Dearborn Division Sharon Steel Corp.
D4 Disston Division, H. K. Porter Co. Inc
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md.Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.
M22 Mill Strip Products Co.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mill
N15 Northwestern S.&W. Co.
N19 Northeastern Steel Corp.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co. Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer.Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearin
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steel
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Ste Div., Colo. Fuel & Iro
W13 Wilson Steel & Wire C
W14 Wisconsin Steel Div., International Harveste
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tub

STRIP

Hot-Rolled Carbon

...r,Ala.(27) R2 ..4.925
...rt,Pa. P7 .....4.925
...l. L1 .....5.125
...l,Ky,(8) A10 ...4.925
...L A11 .....5.125
...er,Ala. T2 ....4.925
...nham C15 .....4.925
...(27) R2 .....4.925
...hocken,Pa. A3 ..4.975
...f M1 .....5.025
...Mich. G5 .....5.025
...d,Ala. T2 .....4.925
...a,Calif. K1 ....5.825
...d. U5 .....4.925
...rbor,Ind. I-2, Y1 4.925
...wn,Pa.(25) B2 .4.925
...na,N.Y.(25) B2 4.925
...eles(25) B3 ....5.675
...a,Colo. C10 ...6.025
...g,Calif. C11 ..5.675
...le,Ill. A1 .....4.925
...ncisco S7 .....6.35
...25) B3 .....6.35
...N14 .....6.35
...Pa. S3 .....4.925
...rancisco(25) B3 5.675
...wsPoint,Md. B2 4.925
...,Ill.(1) N15 ..4.925
...,Ill. N15 .....5.025
...e,Calif. C11 ...5.675
...O. R2 .....4.925
...,W.Va. W6 ....4.925
...town U5 .....4.925

Hot-Rolled Alloy

...e,Pa. S18 .....8.10
...Pa. S3 .....8.10
...d. U5 .....8.10
...S5 .....8.35
...rbor,Ind. Y1 ....8.10
...City,Mo. S5 ....8.35
...eles B3 .....9.30
...ille,O. S3 .....8.10
...t,Ky. A2 .....8.10
...Pa. S3 .....8.10
...go,Ill. W14 ....8.10
...town U5, Y1 ....8.10

Hot-Rolled Strength, Low-Alloy

...er,Ala. T2 .....7.325
...hocken,Pa. A3 ..7.325
...Mich. G5 .....7.425
...d,Ala. T2 .....7.325
...Pa. S3 .....7.325
...d. U5 .....7.325
...rbor,Ind. I-2, Y1 7.325
...anna,N.Y. B2..7.325
...eles(25) B3 ....8.075
...25) B3 .....8.325
...Pa. S3 .....7.325
...go,Ill. W14 ....7.325
...rancisco(25) B3.8.075
...wsPoint,Md. B2. 7.325
...O. R2 .....7.325
...,W.Va. W6 ....7.325
...town U5, Y1 ...7.325

Hot-Rolled Ingot Iron

...l,Ky.(8) A10 ..5.175
...O. R2 .....5.675

Cold-Rolled Carbon

...on,Ind. G6 .....7.15
...ore T6 .....7.15
... T6 .....7.70
...2 S40 .....7.15
...nd A7, J5 .....7.15
...hocken,Pa. A3 ..7.20
...rn,Mich. D3 ....7.25
... D2, M1, P20 ...7.25
...O. G6 .....7.15
... Mich. G5 .....7.25
...on,Ill. M22 .....7.25
...bee,W.Va. F4 ...7.15
...a,Calif. K1 .....9.00
...inPark,Ill. T6 ...7.25
...rbor,Ind. Y1 ....7.15
...apolis J5 .....7.30
...eles J5 .....9.05
...eles C1 .....9.20
...dford, Mass. R10 .7.60
...itain(10) S15 ....7.15
...stle,Pa. B4, E5 ..7.15
...aven,Conn. D2 ...7.60
...nsington,Pa. A6..7.15
...cket,R.I. R3 .....7.80
...cket,R.I. N8 ....7.70
...elphia(45) P24 ...7.70
...rgh J5 .....7.15
...ale,Ill. A1 .....7.25
...N.Y. (32) R6 ....7.15
...,Pa. S3 .....7.15
...n,N.J.(31) R5 ...8.60
...gford,Conn. W2 ..7.60
...n,O. R2, T5 ....7.15
...n,W.Va. W6 .....7.15
...ster,Mass. A7 ....7.70
...stown J5, Y1 ....7.15

STRIP, Cold-Rolled Alloy

Boston T6	15.40
Carnegie,Pa. S18	15.05
Cleveland A7	15.25
Dover,O. G6	15.05
Farrell,Pa. S3	15.05
FranklinPark,Ill. T6	15.05
Harrison,N.J. C18	15.05
Indianapolis J5	15.20
Lowellville,O. S3	15.05
Pawtucket,R.I. N8	15.40
Riverdale,Ill. A1	15.05
Sharon,Pa. S3	15.05
Worcester,Mass. A7	15.55
Youngstown J5	15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.45
Dearborn,Mich. D3	10.60
Dover,O. G6	10.45
Ecorse,Mich. G5	10.55
Farrell,Pa. S3	10.50
Ind.Harbor,Ind. Y1	10.65
Sharon,Pa. S3	10.50
Warren,O. R2	10.45
Weirton,W.Va. W6	10.50
Youngstown Y1	10.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	7.90

STRIP, C.R. Electrogalvanized

Cleveland A7	7.15*
Dover,O. G6	7.15*
Evanston,Ill. M22	7.25*
Riverdale,Ill. A1	7.25*
Warren,O. B9, T5	7.15*
Worcester,Mass. A7	7.70*
Youngstown J5	7.15*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	7.275

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Riverdale, Ill. A1	5.50
Sharon,Pa. S3	5.35
Youngstown U5	5.35

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	....	....
Fostoria,O. S1	10.05	11.15	13.10	16.10	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	...	....	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles J5	11.15	12.60	14.80	....	....
NewBritain,Conn.(10) S15.	8.95	10.40	12.60	15.60	18.55
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6..	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)			Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	...	...	18.10	21.95	26.30
Buffalo W12	...	...	18.10	....	....
Fostoria,O. S1	...	...	18.30	22.15	....
FranklinPark,Ill. T6	...	...	18.45	22.30	26.65
Harrison,N.J. C18	...	...	18.10	21.95	26.30
NewYork W3	...	...	18.10	21.95	26.30
Palmer,Mass. W12	...	...	18.10	....	....
Trenton,N.J. R5	...	...	18.10	21.95	26.30
Worcester,Mass. A7, T6..	...	...	18.10	21.95	26.30
Youngstown J5	...	...	18.45	22.30	26.65

SILICON STEEL

H.R.SHEETS(22 Ga.,cut lengths)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom,W.Va. W10	....	....	11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95
Zanesville,O. A10 (SP coils)	....	....	11.55	12.65	13.70

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom,W.Va. W10.	....	11.35	12.05	13.15	14.20
Brackenridge,Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	9.825*	11.05*	11.75*	12.85*	....
IndianaHarbor,Ind. I-2 ..	9.625†	10.85*	11.55*	12.65*	....
Mansfied,O. E6	9.625*	11.35	12.05	13.50	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10 (FP coils)	...	11.35	12.05	13.15	14.20

H.R. SHEETS (22Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom, W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	14.75	15.55	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4.	....	17.60	19.20	19.70	20.20	....
Butler,Pa. A10	....	....	19.20	19.70	20.20	....
Vandergrift,Pa. U5 ..	16.60	17.60	19.20	19.70	20.20	15.25**
Warren,O. R2	....	....	....	....	....	15.25‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.05	$10.30
Fairfield,Ala.T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif.K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Irvin,Pa. U5	10.05	10.30
Pitts.Calif. C11.	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va.W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2, Y1.	7.85
Irvin,Pa. U5	7.85
Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
SparrowsPoint,Md. B2.	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	$7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5	$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	7.65
Aliquippa,Pa. J5	7.65
Alton,Ill. L1	7.85
Atlanta A11	7.65
Bartonville,Ill. K4	7.75
Buffalo W12	7.65
Chicago W13	7.65
Cleveland A7, C20	7.65
Crawfordsville,Ind. M8.	7.75
Donora,Pa. A7	7.65
Duluth A7	7.65
Fairfield,Ala. T2	7.65
Fostoria,O.(24) S1	7.75
Houston S5	7.90
Jacksonville,Fla. M8	8.00
Johnstown,Pa. B2	7.65
Joliet,Ill. A7	7.65
KansasCity,Mo. S5	7.90
Kokomo,Ind. C16	7.75
LosAngeles B3	8.60
Minnequa,Colo. C10	7.90
Monessen,Pa. P7, P16	7.65
N.Tonawanda,N.Y. B11	7.65
Palmer,Mass. W12	7.95
Pittsburg,Calif. C11	8.60
Portsmouth,O. P12	7.65
Rankin,Pa. A7	7.65
S.Chicago,Ill. R2	7.65
S.SanFrancisco C10	8.60
SparrowsPoint,Md. B2	7.75
Sterling,Ill.(1) N15	7.65
Sterling,Ill. N15	7.75
Struthers,O. Y1	7.65
Waukegan,Ill. A7	7.65
Worcester,Mass. A7	7.95

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	12.65
Buffao W12	12.65
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	12.65
Minnequa,Colo. C10	12.775
Monessen,Pa. P16	12.65
Muncie,Ind. I-7	12.85
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	12.95
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt. Md. B2	12.75
Struthers,O. Y1	12.65
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
New Haven,Conn. A7	9.60
Palmer,Mass. W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester,A7, J4, T6	9.60

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	15.80
Bartonville,Ill. K4	15.70
Buffalo W12	15.60
Chicago W13	15.60
Cleveland A7	15.60
Crawfordsville,Ind. M8	15.70
Fostoria,O. S1	15.60
Houston S5	15.85
Jacksonville,Fla. M8	15.95
Johnstown,Pa. B2	15.60
KansasCity,Mo. S5	15.85
Kokomo,Ind. C16	15.60
Minnequa,Colo. C10	15.85
Monessen,Pa. P7, P16.	15.60
Muncie,Ind. 1-7	15.80
Palmer,Mass. W12	15.90
S.SanFrancisco C10	16.45
Waukegan,Ill. A7	15.60
Worcester,Mass. A7, T6	15.90

ROPE WIRE

Bartonville,Ill. K4	12.75
Buffalo W12	12.75
Fostoria,O. S1	12.75
Johnstown,Pa. B2	12.75
Monessen,Pa. P7	12.75
Muncie,Ind. I-7	12.95
Palmer,Mass. W12	13.05
Portmouth,O. P12	12.75
Roebling,N.J. R5	13.05
SparrowsPt.,Md. B2	12.85
Struthers,O. Y1	12.75
Worcester,Mass. J4	13.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4 ....16.55
Monessen,Pa. P16 .....16.55
Roebling,N.J. R5 .....17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6 .....11.65
Baltimore T6 .....11.95
Boston T6 .....11.95
Buffalo W12 .....11.65
Chicago W13 .....11.75
Cleveland A7 .....11.65
Crawfordsville,Ind. M8.11.65
Dover,O. G6 .....11.65
Fostoria,O. S1 .....11.95
FranklinPark,Ill. T6 ..11.75
Kokomo,Ind. C16 .....11.65
Massillon,O. R8 .....11.65
Milwaukee C23 .....11.85
Monessen,Pa. P7, P16..11.65
Palmer,Mass. W12 ....11.95
Pawtucket,R.I. N8 ....11.95
Philadelphia P24 .....11.95
Riverdale,Ill. A1 .....11.75
Rome,N.Y. R6 .....11.65
Sharon,Pa. S3 .....11.65
Trenton,N.J. R5 .....11.95
Warren,O. B9 .....11.65
Worcester,Mass. A7, T6 11.95

NAILS, Stock **Col.**

AlabamaCity,Ala. R2 ...173
Aliquippa,Pa. J5 173
Atlanta A11 175
Bartonville,Ill. K4 175
Chicago W13 173
Cleveland A9 173
Crawfordsville,Ind. M8 ..175
Donora,Pa. A7 173
Duluth A7 173
Houston,Tex. S5 178
Fairfield,Ala. T2 173
Jacksonville,Fla.(20) M8.184
Joliet,Ill. A7 173
Johnstown,Pa. B2 173
KansasCity,Mo. S5 178
Kokomo,Ind. C16 175
Minnequa,Colo. C10 178
Monessen,Pa. P7 173
Pittsburg,Calif. C11 192
Rankin,Pa. A7 173
S.Chicago,Ill. R2 173
SparrowsPt.,Md. B2 175
Sterling,Ill.(7) N15 175
Worcester,Mass. A7 179

(To Wholesalers; per cwt)

Galveston,Tex. D7 ....$8.95

NAILS, Cut (100 lb keg)
To Dealers (33)

Conshohocken,Pa. A3 ..$9.80
Wheeling,W.Va. W10 ...9.80

POLISHED STAPLES **Col.**

AlabamaCity,Ala. R2 ...175
Aliquippa,Pa. J5 175
Atlanta A11 177
Bartonville,Ill. K4 177
Crawfordsville,Ind. M8 ..177
Donora,Pa. A7 175
Duluth A7 175
Fairfield,Ala. T2 175
Jacksonville,Fla.(20) M8.186
Joliet,Ill. A7 175
Johnstown,Pa. B2 175
Kokomo,Ind. C16 177
Minnequa,Colo. C10 180
Pittsburg,Calif. C11 194
Rankin,Pa. A7 175
S.Chicago,Ill. R2 175
SparrowsPt.,Md. B2 177
Sterling,Ill.(7) N15 175
Worcester,Mass. A7 181

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)
Coil No. 3150

AlabamaCity,Ala. R2. $10.26
Atlanta A11 .....10.36
Bartonville,Ill. K4 .....10.36
Buffalo W12 .....9.82
Chicago W13 .....10.26
Crawfordsville,Ind. M8.10.36
Donora,Pa. A7 .....10.26
Duluth A7 .....10.26
Fairfield,Ala. T2 .....10.26
Houston S5 .....10.51
Jacksonville,Fla. M8 ...10.82
Johnstown,Pa. B2 .....10.26
Joliet,Ill. A7 .....10.26
KansasCity,Mo. S5 ....10.51
Kokomo,Ind. C16 .....10.36
LosAngeles B3 .....11.05
Minnequa,Colo. C10....10.51
Pittsburg,Calif. C11 ...11.04
S.Chicago,Ill. R2 .....10.26
S.SanFrancisco C10 ...11.04
SparrowsPt.,Md. B2 ...10.36
Sterling,Ill.(37) N15 ...10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2..$10.60
Atlanta A11 .....10.70
Bartonville,Ill. K4 ....10.70
Buffalo W12 .....10.15
Chicago W13 .....10.60
Crawfordsville,Ind. M8.10.70
Donora,Pa. A7 .....10.60
Duluth A7 .....10.60
Fairfield,Ala. T2 .....10.60
Houston S5 .....10.85
Jacksonville,Fla. M8 ..11.16
Johnstown,Pa. B2 ....10.60
Joliet,Ill. A7 .....10.60
KansasCity,Mo. S5 ....10.85
Kokomo,Ind. C16 .....10.70
LosAngeles B3 .....11.40
Minnequa,Colo. C10 ...10.85
Pittsburg,Calif. C11 ...11.40
S.Chicago,Ill. R2 .....10.60
S.SanFrancisco C10 ...11.40
SparrowsPt.,Md. B2 ...10.70
Sterling,Ill.(37) N15 ..10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2..$10.65
Atlanta A11 .....10.75
Bartonville,Ill. K4 .....10.75
Buffalo W12 .....10.20
Chicago W13 .....10.65
Crawfordsville,Ind. M8.10.75
Donora,Pa. A7 .....10.65
Duluth A7 .....10.65
Fairfield,Ala. T2 .....10.65
Houston S5 .....10.90
Jacksonville,Fla. M8 ..11.21
Johnstown,Pa. B2 ....10.65
Joliet,Ill. A7 .....10.65
KansasCity,Mo. S5 ....10.90
Kokomo,Ind. C16 .....10.75
LosAngeles B3 .....11.45
Minnequa,Colo. C10 ...10.90
Pittsburg,Calif. C11 ...11.45
S.Chicago,Ill. R2 .....10.65
S.SanFrancisco C10 ...11.45
SparrowsPt.,Md. B2 ...10.75
Sterling,Ill.(37) N15 ..10.75

BALE TIES, Single Loop **Col.**

AlabamaCity,Ala. R2 ...212
Atlanta A11 214
Bartonville,Ill. K4 214
Crawfordsville,Ind. M8 ..214
Donora,Pa. A7 212
Duluth A7 212
Fairfield,Ala. T2 212
Houston S5 217
Jacksonville,Fla. M8 219
Joliet,Ill. A7 212
KansasCity,Mo. S5 217
Kokomo,Ind. C16 214
Minnequa,Colo. C10 217
Pittsburg,Calif. C11 236
S.SanFrancisco C10 236
Sterling,Ill.(7) N15 214
SparrowsPt.,Md B2 214
Williamsport,Pa. S19 175

FENCE POSTS

Birmingham C15 171
ChicagoHts.,Ill. C2, I-2..172
Duluth A7 172
Franklin,Pa. F5 172
Huntington,W.Va. C15 ..171
Johnstown,Pa. B2 172
Marion,O. P11 172
Minnequa,Colo. C10 177
Sterling,Ill.(1) N15 172
Tonawanda,N.Y. B12 ...174

WIRE, Barbed **Col.**

AlabamaCity,Ala. R2 ..193**
Aliquippa,Pa. J5 .....190§
Atlanta A11 .....198*
Bartonville,Ill. K4 198
Crawfordsville,Ind. M8 ..198
Donora,Pa. A7 .....193†
Duluth A7 .....193†
Fairfield,Ala. T2 .....193†
Houston,Tex. S5 .....198**
Jacksonville,Fla. M8 203
Johnstown,Pa. B2 .....196§
Joliet,Ill. A7 .....193†
KansasCity,Mo. S5 ....198**
Kokomo,Ind. C16 .....195†
Minnequa,Colo. C10 ....198**
Monessen,Pa. P7 .....196*
Pittsburg,Calif. C11 ...213†
Rankin,Pa. A7 .....193†
S.Chicago,Ill. R2 .....193**
S.SanFrancisco C10 ...213**
SparrowsPoint,Md. B2..198§
Sterling,Ill.(7) N15 ....198§

WOVEN FENCE, 9-15 Ga. **Col.**

Ala.City,Ala. R2 .....187**
Aliq'ppa,Pa.9-14½ga.J5 190§
Atlanta A11 .....192*
Bartonville,Ill. K4 192
Crawfordsville,Ind. M8 ..192
Donora,Pa. A7 .....187†
Duluth A7 .....187†
Fairfield,Ala. T2 .....187†
Houston,Tex. S5 .....192**
Jacksonville,Fla. M8 197
Johnstown,Pa.(43) B2 ..190§
Joliet,Ill. A7 .....187†
KansasCity,Mo. S5 ....192**
Kokomo,Ind. C16 .....189†
Minnequa,Colo. C10 ....192**
Pittsburg,Calif. C11 ...210†
Rankin,Pa. A7 .....187†
S.Chicago,Ill. R2 .....187**
Sterling,Ill.(7) N15 ....192§

WIRE (16 gage)	**An'ld Galv. Stone**	**Stone**
Ala.City,Ala.R2	17.15	18.70**
Aliq'ppa,Pa.	J5.17.15	18.95
Bartonville K4	..17.25	19.05
Cleveland A7	...17.15	....
Crawf'dsville M8	17.25	19.05
Fostoria,O.	S1 ..17.65	19.20†
Houston S5	....17.40	18.95**
Jacksonville	M8.17.50	19.30
Johnstown B2	..17.15	18.95§
Kan.City,Mo.	S5 17.40	....
Kokomo C16	...17.25	18.80†
Minnequa C10	..17.40	18.95**
P'lm'r,Mass.	W12 17.45	19.00†
Pitts.,Calif.	C11.17.50	19.05†
SparrowsPt.	B2. 17.25	19.05§
Sterling(37)	N15.17.25	19.05§
Waukegan A7	..17.15	18.70†
Worcester A7	...17.45	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	..8.65 9.20**
Aliquippa J5	....8.65 9.325§
Atlanta(48) A11	..8.75 9.425*
Bartonville(48) K4	.8.75 9.425
Buffalo W12	.....8.65 9.20†
Cleveland A7	.....8.65 ....
Crawfordsville M8	.8.75 9.425
Donora,Pa. A7	...8.65 9.20†
Duluth A7	.....8.65 9.20†
Fairfield T2	.....8.65 9.20†
Houston(48) S5	..8.90 9.45**
Jacks'ville,Fla. M8	9.00 9.675
Johnstown B2(48)	8.65 9.325§
Joliet,Ill. A7	.....8.65 9.20†
Kans.City(48) S5	.8.90 9.45**
Kokomo C16	.....8.75 9.30†
LosAngeles B3	..9.60 10.275§
Minnequa C10	...8.90 9.45**
Monessen P7(48)	..8.65 9.25*
Palmer,Mass.	W12.8.95 9.50†
Pitts.,Calif.	C11..9.60 10.15†
Rankin,Pa. A7	...8.65 9.20†
S.Chicago R2	....8.65 9.20**
S.SanFran.	C10..9.60 10.15**
Spar'wsPt.	B2(48) 8.75 9.425§
Sterling(48)	N15..8.90 9.575§
Sterling(1)(48)	..8.80 9.475§
Struth'rs,O.	(48)Y1 8.65 9.30†
Worcester,Mass.	A7 8.95 9.50†

Based on zinc price of: *13.50c. †5c. §10c. ‡Less than 10c. ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts

Full Size Body (cut thread)
½ in. and smaller:
6 in. and shorter.... 49.0
Longer than 6 in. .. 39.0
⅝ in. thru 1 in.:
6 in. and shorter.... 39.0
Longer than 6 in. .. 35.0
1⅛ in. and larger:
All lengths 35.0
Undersized Body (rolled thread)
½ in. and smaller:
6 in. and shorter... 49.0
Carriage, Machine, Lag Bolts
Hot Galvanized:
½ in. and smaller:
6 in. and shorter... 29.0
Longer than 6 in. .. 15.0
⅝ in. and larger:
All lengths 12.0
Lag Bolts (all diam.)
6 in. and shorter... 49.0
Longer than 6 in. .. 39.0
Plow and Tap Bolts
½ in. and smaller by 6 in. and shorter 49.0
Larger than ½ in. or longer than 6 in. .. 39.0
Blank Bolts 39.0
Step, Elevator, Tire Bolts 49.0
Stove Bolts, Slotted:
⅛ to ¼-in. incl.,
3 in. and shorter.. 55.0
5/16 to ½ in., inclusive 55.0

NUTS

Reg. & Heavy Square Nuts:
All sizes 55.5
Square Nuts, Reg. & Heavy, Hot Galvanized:
All sizes 41.0
Hex Nuts, Reg. & Heavy, Hot Pressed:
¾ in. and smaller.. 60.5
⅞ in. to 1 in., incl. 55.5
1⅛ in. to 1½ in., incl. 58.5
1⅝ in. and larger.. 53.5
Hex Nuts, Reg. & Heavy, Cold Punched:
¾ in. and smaller.. 60.5
⅞ in. to 1½ in., incl. 55.5
1⅝ in. and larger.. 53.5
Hex Nuts, All Types, Hot Galvanized:
¾ in. and smaller.. 46.5
⅞ in. to 1 in., incl.. 41.5
1⅛ in. to 1½ in., incl. 46.5
Hex Nuts, Semifinished, Heavy (Incl. Slotted):
¾ in. and smaller.. 60.5
⅞ in. to 1½ in., incl. 55.5
1⅝ in. and larger.. 53.5
Hex Nuts, Finished (Incl. Slotted and Castellated):
1 in. and smaller.. 63.0
1⅛ in. to 1½ in., ... incl. 59.0
1⅝ in. and larger.. 53.5
Semifinished Hex Nuts, Reg. (Incl. Slotted):
⅝ in. and smaller.. 60.5
¾ in. to 1 in., incl. 63.0
1⅛ in. to 1½ in., ... incl. 59.0
1⅝ in. and larger.. 53.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)
Hex Head Capscrews, Coarse or Fine Thread, Bright:
6 in. and shorter:
⅝ in. and smaller.. 40.0
¾, ⅞ and 1 in. diam. 22.0
Longer than 6 in.:
⅝ in. and smaller.. 8
¾, ⅞ and 1 in. diam. ..... +6
High Carbon, Heat Treated:
6 in. and shorter:
⅝ in. and smaller.. 26
¾, ⅞ and 1 in. diam. 3
Longer than 6 in.:
⅝ in. and smaller.. +13
¾, ⅞ and 1 in. diam. ..... +32
Flat Head Capscrews:
¾ in. and smaller.. +76
Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam:
6 in. and shorter... N
Longer than 6 in... +23

RIVETS

F.o.b. Cleveland and freight equalized with Pitt burgh, f.o.b. Chicago and freight equalized with Bi mingham except where equa ization is too great.
Structural ½ in., larger 12.
7/16 in. under: List less 19

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimu wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Wel H.R.
1	13	....	25.98	23.54
1¼	13	....	30.78	23.36
1½	13	29.03	34.01	25.83
1¾	13	34.29	40.18	30.51
2	13	38.44	45.05	34.20
2¼	13	43.29	50.75	38.52
2¼	12	46.99	55.06	41.81
2½	12	51.76	60.65	46.05
2¾	12	56.04	65.67	49.88
3	12	59.76	70.03	53.19

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rai All No. 2	Tee Rai 60 Und
RAILS				
Bessemer,Pa. U5	5.525	5.425	....	6.
Ensley,Ala. T2	5.525	5.425	....	6.
Fairfield,Ala. T2	....	....	....	6.
Huntington,W.Va. C15	....	....	....	6.
Gary,Ind. U5	5.525	5.425	....	.
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	.
Johnstown,Pa. B2	....	....	...(16)	6.
Lackawanna,N.Y. B2	5.525	5.425	....	6.
Minnequa,Colo. C10	5.525	5.425	....	7.
Steelton,Pa. B2	5.525	5.425	....	.
Williamsport,Pa. S19	....	....	....	6.
TIE PLATES				
Fairfield,Ala. T2 .....6.60				
Gary,Ind. U5 .....6.60				
Ind.Harbor,Ind. I-2 ....6.60				
Lackawanna,N.Y. B2 ..6.60				
Minnequa,Colo. C10 ....6.60				
Seattle B3 .....6.75				
Steelton,Pa. B2 .....6.60				
Torrance,Calif. C11 ....6.75				
JOINT BARS				
Bessemer,Pa. U5 .....6.975				
Fairfield,Ala. T2 .....6.975				
Ind.Harbor,Ind. I-2 ...6.975				
Joliet,Ill. U5 .....6.975				
Lackawanna,N.Y. B2 ..6.975				
Minnequa,Colo. C10 ...6.975				
Steelton,Pa. B2 .....6.975				
AXLES				
Ind.Harbor,Ind. S13 ...8.775				
Johnstown,Pa. B2 ....8.775				

TRACK BOLTS, Untreated

Cleveland R2 .....14.
KansasCity,Mo. S5 ....14.
Lebanon,Pa. B2 .....14.
Minnequa,Colo. C10 ...14.
Pittsburgh P14 .....14.
Seattle B3 .....15.

SCREW SPIKES

Lebanon,Pa. B2 .....14.

STANDARD TRACK SPIKES

Fairfield,Ala. T2 .....9.
Ind.Harbor,Ind. I-2, Y1.9.
KansasCity,Mo. S5 .....9.
Lebanon,Pa. B2 .....9.
Minnequa,Colo. C10 ....9.
Pittsburgh J5 .....9.
Seattle B3 .....10.
S.Chicago,Ill. R2 .....9.
Struthers,O. Y1 .....9.
Youngstown R2 .....9.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 13 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 1000 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 6.045c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.60c. for widths ⅝ in. and und by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 poi lower.
(38) 14 Ga. & lighter; 48" narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0. higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. m deld. in mill zone or wit switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(45) 0.022 in. and lighter, 0.022", 8.20c.
(46) Special quality.
(48) 6-7 Ga.
(49) 3½ in. and smaller roun 8.65c, over 3½ in. and ot shapes.

ILESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

nches	2	2½	3	3½	4	5	6
er Ft	37c	58.5c	76.5c	92c	$1.09	$1.48	$1.92
s Per Ft	3.68	5.82	7.62	9.20	10.89	14.81	19.18

	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
opa, Pa. J5	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
dge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
stown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

TRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

stown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

nches	⅛	¼	⅜	½	¾	1	1¼
er Ft	5.5c	6c	6c	8.5c	11.5c	17c	23c
s Per Ft	0.24	0.42	0.57	0.85	1.13	1.68	2.28

	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
opa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
od, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
s, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
a, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
a Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
ws Pt., Md. B2	3.5	+23	8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
and, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
stown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

nches	1½	2	2½	3	3½	4
er Ft	27.5c	37c	58.5c	76.5c	92c	$1.09
s Per Ft	2.73	3.68	5.82	7.62	9.20	10.89

	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
opa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
od, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
s, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
a, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
a Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
ws Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
and, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
stown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

alvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

inless Steel

Representative prices, cents per pound; subject to current lists of extras

	—Rerolling— Ingot	Slabs	Forg- ing Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Struc- tural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
.....	22.00	27.00	....	36.00	....	42.00	44.25	48.50	45.00
.....	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
.....	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
.....	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
....	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
....	....	32.00	41.00	....	45.50	48.00	50.00	56.75	56.75
....	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.50	55.50
....	....	....	48.25	51.50	53.00	55.50	58.50	63.25	63.25
.....	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
.....	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
.....	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
.....	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
....	....	....	....	....	86.50	....	92.75	....	104.50
....	39.75	49.50	62.25	69.25	69.25	73.00	76.75	81.50	81.50
....	....	....	70.00	76.50	77.00	80.75	84.50	89.25	89.25
....	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
.....	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
....	....	....	118.75	....	132.00	138.50	105.50	108.00	149.25
CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
....	....	....	32.00	....	35.75	37.75	40.25	48.25	48.25
.....	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
.....	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
....	....	....	28.75	....	32.50	34.25	36.25	48.25	48.25
....	....	33.50	34.25	41.75	39.25	41.25	45.25	62.00	62.00
....	17.00	21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
....	....	....	29.50	....	33.00	34.75	36.75	51.75	51.75
....	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
....	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

ss Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Div., Porter Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. & Co.; A. M. Byers Co.; G. C. Carlson Inc.; Charter Wire Products Co.; Crucible o. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube ndiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel ohnson Steel & Wire Co. Inc.; Jones & Laughlin Steel Corp.; Joslyn Mfg. & Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McInnes Steel IcLouth Steel Corp.; Metal Forming Corp.; National-Standard Co.; National Tube J. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Sawhill Tubular Products Inc.; Sharon Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stain- elded Products Inc.; Standard Tube Co.; Stainless Steel Div., Jones & Laughlin Steel Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing rent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

Stainless	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	40.00
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.40	49.50	54.50	58.75
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.95	40.25

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates. Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.290	Cr Hot Work	0.45-0.495
Extra Carbon	0.345	W-Cr Hot Work	0.43-0.475
Special Carbon	0.41-0.45	V-Cr Hot Work	0.460
Oil Hardening	0.450	Hi-Carbon-Cr	0.830

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.170
18.25	4.25	1	4.75	...	2.385
18	4	2	9	...	2.755
18	4	2	....	...	1.845
18	4	1	....	...	1.680
9	3.5	..	....	...	1.275
13.5	4	3	....	...	1.945
13.75	3.75	2	5	...	2.325
6.4	4.5	1.9	....	5	1.185
6	4	3	....	6	1.430
1.5	4	1	....	8.5	1.040

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2. and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal transportation tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
AlabamaCity,Ala. R2	62.00	62.50	....	....
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	....	66.50	....
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	68.62	69.12	69.12	69.62
Muskegon,Mich., deld.	....	74.12	74.12	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,O., deld.	69.12	69.62	69.62	70.12
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	66.50	67.00	67.50	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
New York, deld.	....	75.10	75.60	....
Newark,N.J., deld.	72.29	72.79	73.29	73.79
Philadelphia, deld.	70.01	70.51	71.01	71.59
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Youngstown District				
Hubbard, O. Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,O., deld.	70.90	....	71.40	71.90
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	66.50	67.00	67.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,O. I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.54	73.04	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,O. I-3, J1	78.00
Buffalo H1	78.50

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	82.20
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Houston, Seattle no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13§	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.28	8.88	9.76	....	8.76	9.06	11.34#	15.18	9.19	8.66	10.14
Birmingham	8.18	9.45	10.15	....	8.23	8.60	10.57	....	8.64	8.56	10.70
Boston	9.38	10.44	11.45	....	9.42	9.73	....	15.28	9.63	9.72	11.26
Buffalo	8.25	9.45	11.07	....	8.50	8.80	....	15.00	8.90	8.90	10.45
Chattanooga	7.99	9.24	9.10	....	8.00	8.24	10.04	....	8.44	8.40	10.26
Chicago	8.20	9.45	10.00	....	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.05	....	8.54	8.92	9.31	14.96	9.18	8.93	10.21
Cleveland	8.18	9.45	9.95	....	8.33	8.69	....	14.74	9.01	8.79	10.11
Denver	9.38	11.75	....	....	9.41	9.78	11.10	....	9.82	9.74	11.06
Detroit	8.43	9.70	10.35	....	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95[10]	....	8.50	8.75	9.05[10]	....	9.00	8.85	10.19
Houston	8.45	9.75	8.45	....	8.60	9.05	11.10	....	9.10	9.05	10.30
Jackson, Miss.	8.09	9.34	9.79	....	8.16	8.41	10.23	....	8.54	8.50	10.34
Los Angeles	9.50	10.75	11.65	....	9.55	9.70	12.75	16.00	9.60	9.55	11.70
Milwaukee	8.33	9.58	10.13	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.35	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	....	9.31	9.57	....	15.09	9.35	9.43	10.71
Norfolk, Va.	8.05	....	....	....	8.55	8.60	10.80	....	8.95	8.45	9.95
Philadelphia	8.00	8.90	9.87	51.94	8.67	8.65	11.51#†††	15.01	8.50	8.77	9.77**
Pittsburgh	8.18	9.45	10.35	50.00	8.33	8.60	....	14.65	8.64	8.56	9.88
Portland, Oreg.	8.50	11.20	11.55	57.20	11.35‡‡	8.65	14.65#	15.95	9.60	8.30	12.50
Richmond, Va.	8.45	....	10.40	....	9.15	9.15	....	....	9.40	8.85	10.35
St. Louis	8.54	9.79	10.36	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.79	10.04	10.61	....	8.84	9.36	9.66	....	9.38	9.30	10.49
San Francisco	9.35	10.75	11.00	54.85	9.45	9.70	13.00	16.00	9.50	9.60	12.00
Seattle	9.95	11.15	12.00	57.20	10.00	10.10	14.05	16.35	9.80	9.70	12.10
Spokane, Wash.	9.95	11.15	12.00	....	10.00	10.10	14.05	17.10	9.80	9.70	12.10
Washington	8.48	9.58	....	....	9.06	9.15	9.73	....	9.35	8.86	10.36

*Prices do not include gage extras; †prices include gage and coating extras, except in Birmingham (coating extra excluded); ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.; #1 in. round C-1018; †††item quantity.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; [3]—400 to 9999 lb; [5] 1000 to 1999 lb; [8]—2000 to 3999 lb; [10]—2000 lb and over.

ractories

Fire Clay Brick (per 1000)

eat Duty: Ashland, Grahn, Hayward, s, Haldeman, Olive Hill, Ky., Athens, Tex., Beech Creek, Clearfield, Curwens- ock Haven, Lumber, Orviston, West Pa., Bessemer, Ala., Farber, Mexico, is, Vandalia, Mo., Ironton, Oak Hill, Portsmouth, O., Ottawa, Ill., Stevens Ga., $135; Salina, Pa., $140; Niles, 8; Cutler, Utah, $165.

uty: Ironton, O., Vandalia, Mo., Olive ., Clearfield, Salina, Pa., New Savage, t., Louis, $175; Stevens Pottery, Ga., utler, Utah, $233.

Silica Brick (per 1000)

d: Alexandria, Claysburg, Mt. Union, Pa., Ensley, Ala., Pt. Matilda, Pa., outh, O., Hawstone, Pa., $150; Warren, Windham, O., Hays, Latrobe, Morris- Pa., $155; E. Chicago, Ind., Joliet, le, Ill., $160; Lehigh, Utah, $175; Los , $180.

uty: Sproul, Hawstone, Pa., Niles, Windham, O., Leslie, Md., Athens, 157; Morrisville, Hays, Latrobe, Pa., . Chicago, Ind., $167; Curtner, Calif.,

Silica Brick (per 1000)

ld, Pa., $140; Philadelphia, $137; idge, N. J., $135.

Ladle Brick (per 1000)

essed: Alsey, Ill., Chester, New Cumber- N. Va., Freeport, Johnstown, Merrill Vanport, Pa., Mexico, Vandalia, Mo., le, Irondale, New Salisbury, O., $96.75; ld, Pa., Portsmouth, O., $102.

High-Alumina Brick (per 1000)

Cent: St. Louis, Mexico, Vandalia, Mo., anville, Ill., $238; Philadelphia, Clear- a., $230; Orviston, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Orviston, Pa., $305.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Orviston, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, O., $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-41; 70%, $36.40; 60%, $33-36.50. Imported, net tons, f.o.b. cars point of entry duty paid, metallurgical grade: European, $33-34; Mexican, all-rail, duty paid, $25.25-25.75; barge, Brownsville, Tex., $27.25-27.75.

Ores

Lake Superior Iron Ore

(Prices effective for the 1957 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old range bessemer	11.85
Old range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	27.00-27.50
N. African hematite (spot)	nom.
Brazilian iron ore, 68-69%	30.00

Tungsten Ore

Net ton, unit, before duty

Foreign wolframite, good commercial quality	13.75-14.25
Domestic, concentrates mine	55.00

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.35-$1.45 per long ton unit, c.i.f. U. S. ports, duty for buyer's account: other than Indian, $1.35-$1.45; contracts by negotiation.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$55.00-58.00
48% 2.8:1	52.00-55.00
48% no ratio	46.00-48.00

South African Transvaal

48% no ratio	$40.00-41.00
44% no ratio	30.00-31.00

Turkish

48% 3:1	$59.00-62.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	$2.90-3.30
60-65%	3.30-3.60

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

al Powder

ound f.o.b. shipping n ton lots for minus sh, except as noted)

	Cents
Iron, Swedish:	
east of Missis- River, ocean bags	
0 lb and over..	10.50
. Riverton or ien, N. J., west ississippi River.	9.50
Iron, Domestic, % Fe:	
d. east of ssissippi River, 000 lb and over	10.50
b. Riverton, J., west of Missis- pi River	9.50
Iron, Canadian:	
. shipping point	9.50
ytic Iron:	
ng stock, 99.9%	
irregular frag- nts of ⅛ in. x in.	28.00
d, 99.5% Fe..	36.50
aled (99 + %	36.00
aled (99 + % (minus 325 sh)	59.00
Flakes (minus ius 100 mesh)..	29.00
yl Iron:	
99.9%, 3 to 20 mi- ns, depending on de, 93.00-290.00 in ndard 200-lb contain- ; all minus 200 mesh.	

Aluminum:	
Atomized, 500 lb drum, frght allowed	
Carlots	39.50
Ton lots	41.50
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	32.00-39.70†
Bronze, 5000-lb lots	49.50-54.10†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.15
Nickel-Silver, 5000-lb lots	50.20-54.80†
Phosphor-Copper, 5000-lb lots	61.30
Copper (atomized) 5000-lb lots	41.80-50.30‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.02
Stainless Steel, 316	$1.20
Tin	14.50*
Zinc, 5000-lb lots	17.50-30.70‡
Tungsten:	Dollars
Melting grade, 99% 60 to 2000 mesh:	
1000 lb and over	3.75
Less than 1000 lb	3.90
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$57.75
2½	30	37.25
3	40	35.25
4	40	33.25
5½	40	33.00
6	60	30.00
7	60	26.75
8, 9, 10	60	26.50
12	72	25.50
14	60	25.50
16	72	24.50
17	60	25.50
18	72	24.50
20	72	24.00
24	84	24.75

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.25
Saginaw, Mich., deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, O., ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Painesville, O., ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
Neville Island (Pittsburgh), Pa., ovens	29.25
St. Paul, ovens	29.75
Chicago, deld.	33.24
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.85 freight zone from works.

mported Steel

ase per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these tes is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
formed Bars, Intermediate, ASTM-A 305	$6.30	$6.25	$6.25	$6.50
r Size Angles	6.62	6.57	6.57	6.75
ructural Angles	6.62	6.57	6.57	6.75
Beams	6.87	6.82	6.82	7.00
annels	6.87	6.82	6.82	7.00
ates (basic bessemer)	8.35	8.30	8.30	8.60
eets, H.R.	8.25	8.20	8.20	8.50
eets, C.R. (drawing quality)	9.00	8.95	8.95	9.25
rring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	26.79	26.67	26.67	27.36
rbed Wire (†)	6.95	6.95	6.95	7.40
rchant Bars	6.87	6.82	6.82	7.22
t-Rolled Bands	7.20	7.15	7.15	7.55
ire Rods, Thomas Commercial No. 5	6.73	6.73	6.73	7.13
ire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
ight Common Wire Nails (§)	8.38	8.38	8.38	8.58

er 82 lb, net, reel. §Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	29.50
Industrial xylene	32.00-34.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, pre gross ton, Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net tons; $225, Johnstown, Duquesne, Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74% respectively.

(Mn 79-81%). Lump $263 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Managanese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk, 27.75c per lb of contained Cr; c.l. packed 29.3c, ton lot 31.05c; less ton 32.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 34.75c per lb contained Cr, 0.02% max 41.5c, 0.03% max 41c, 0.06% max 39.5c, 0.1% max 39c, 0.15% max 38.75c, 0.2% max 38.5c, 0.5% max 38.25c, 1.0% max 37.5c, 1.5c max 37.35c, 2.0% max 37.25c. Ton lot, add 3.4c, less ton add 5.1c. Carload packed add 1.75c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 29.05c per lb of contained Cr. Packed, c.l. 30.65c, ton 32.45c, less ton 33.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8M x D, 20.85c, per lb of alloy, ton lot 22.10c; less ton lot 23.3c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 41.35c per lb of contained Cr; 1" x down, bulk, 42.35c. Delivered.

Chromium Metal Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **.High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract less caarload lot, packed $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 13c per lb of contained Si. Packed c.l. 15.5c, ton lot 16.95c, less ton 18.6c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosoilicon: Contact, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 20.00c per lb of Si. Packed, cl. 21.65c, ton lot 22.95c, less ton 23.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (1 to 2%). Contract, lump, carload 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, M 14-18% and Si 53-59%). Contract, carlo lump, bulk 23c per lb of alloy, carload pac 24.25c, ton lot 26.15c, less ton 27.15c. livered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, 1.5-3%). Contract, carload, lump, bulk per lb of alloy, carload packed 25.65c, lot 27.95c, less ton 29.45c. Delivered. Spot, 0.25c.

BRIQUTTED ALLOYS

Chromium Briquets: (Weighing approx lb each and containing 2 lb of Cr). Contra carload, bulk 19c per lb of briquet, c load packed in box pallets 19.2c, in b 20.1c; 3000 lb to c.l. in box pallets 20. 2000 lb to c.l. in bags, 21.3c; less than 2 lb in bags 22.2c. Delivered. Add 0.25c notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing app 3 lb and containing 2 lb of Mn). Contra carload, bulk 14.8c per lb of briquet; c packed, pallets 15c, bags 16c; 3000 lb to c pallets 16.2c; 2000 lb to c.l. bags, 17. less ton 18.1c. Delivered. Add 0.25c for not ing. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing appr 3½ lb and containing 2 lb of Mn and appr ½ lb of Si). Contract, c.l. bulk 15.1c lb of briquet; c.l. packed, pallets, 15. bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2 lb to c.l., bags 17.5c; less ton 18.4c. Deliver Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing prox 5 lb and containing 2 lb of Si). C tract, carload, bulk 7.7c per lb of briqu packed, pallets, 7.9c; bags 8.9c; 3000 lb c.l., pallets 9.5c; 2000 lb to c.l. bags 10. less ton 11.4c. Delivered. Spot, add 0.2 (Small size—weighing approx 2½ lb and c taining 1 lb of Si). Carload, bulk 7.8 Packed, pallets 8.05c; bags 9.05c; 3000 lb c.l. pallets 9.65c; 2000 lb to c.l. bags 10.6 less ton 11.55c. Delivered. Add 0.25c for not ing, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ of Mo each). $1.41 per pound of Mo contain f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or m $2.95 per lb of contained W; 2000 lb W 5000 lb W, $3.05: less than 2000 lb W, $3. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% m C 0.4% max). Contract, ton lot 2" x $4.90 per lb of contained Cb. Delivered. Sp add 10c.

Ferrotantalum—Columbium: (Cb 40% app Ta 20% approx, and Cb plus Ta 60% min. 0.30% max). Ton lot 2" x D, $4.25 per of contained Cb plus Ta, delivered; less lot $4.30.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5.7 Fe 20% approx). Contract, c.l. packed ½-in 12 M 19c per lb of alloy, ton lot 20.1 less ton 21.4c. Delivered. Spot, add 0.2

Graphidox No. 5: (Si 48-52%, Ca 5.7%, Ti 11%). C.l. packed, 19c per lb of alloy. lot 20.15c; less ton lot 21.4c, f.o.b. Niag Falls, N. Y.; freight allowed to St. Lo

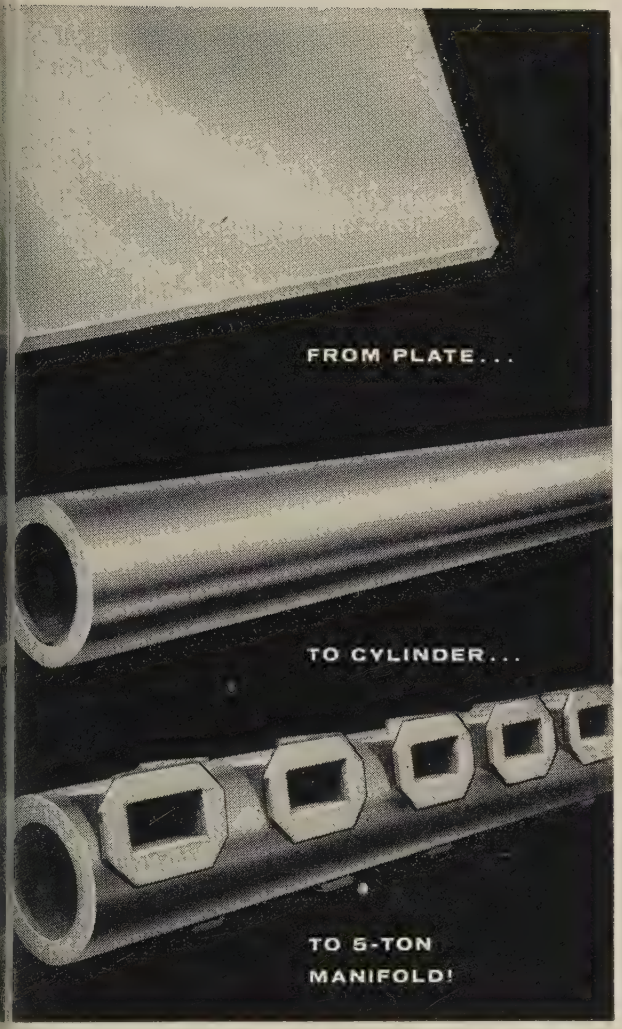
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19 Mn 8-11%). C.l. packed 18.1c per lb of all ton lot 19.55c; less ton lot 20.8c, f.o Niagara Falls, N. Y., freight allowed to Louis.

Simanal: (Approx 20% each Si, Mn, Al; Fe). Lump, carload, bulk 18.50c. Packed 19.50c, 2000 lb to c.l. 20.50c, less than 2 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% content with unitage of $4 for each 1% o above or below the base); carload, f.o.b. ers' works. Mt. Pleasant, Siglo, Tenn., $ per gross ton.

Ferromolybdenum: (55-75%). Per lb of c tained Mo, in 200-lb container, f.o.b. Lan loth and Washington, Pa., $1.68 in all s except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of conta Mo, in cans, $1.39; in bags, $1.38, f.o Langeloth and Washington, Pa.



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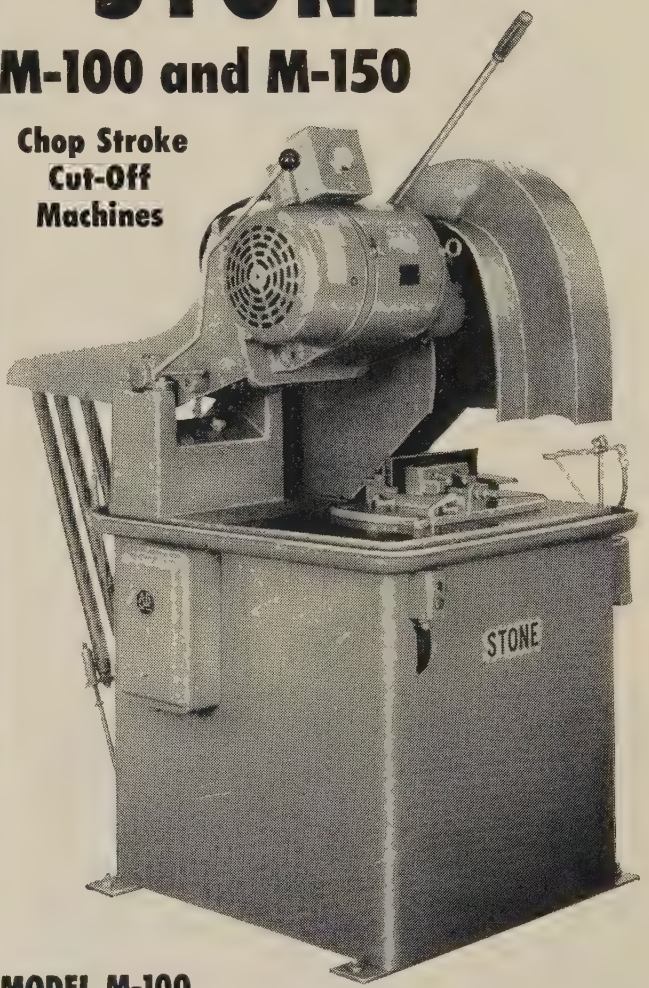

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Scrap Prices Still Going Down

Lack of buying interest depresses market further. STEEL's composite on the prime grade drops another $2 to $48.17, lowest level reported since last May

Scrap Prices, Page 178

Pittsburgh — Declines averaged $2 per ton last week. Although prices are largely nominal because of slack sales, No. 1 heavy melting scrap can probably be purchased for $50 a ton now. Punchings, plate scrap, and turnings are expected to drop next week.

Leading grades of railroad scrap are off, while some cast iron grades are stronger. A steel mill bought 18-8 bundles and solids for $235 a ton last week, down $15 from the previous price.

Philadelphia — Prices are off sharply on small-lot buying. Practically all grades are $2 to $4 a ton lower, No. 2 heavy melting and turnings taking the largest drop. Buying for export is active; two vessels are loading at this port. Prices paid for export tonnage are $2 to $3 over domestic quotations, and the bulk of the movement from nearby yards is for dock delivery.

New York — Steel scrap prices are sagging on small volume new buying. The sharpest break is in No. 2 bundles, brokers' buying price being off $5 a ton. Machine shop turnings are down $3, but borings and turnings are nominal in the absence of buying. Some steel scrap is being bought for export, most tonnage being within $2 to $3 freight to dock. Cast grades are lower, on the average about $1 a ton. Stainless steel scrap buying is slow, and the 18-8 grades are off another $10 a ton.

Boston—No. 1 heavy melting steel declined another $1 a ton and No. 2 bundles $2. Brokers are paying $29-$30, shipping point, for No. 2 bundles. Borings and turnings are slow, and prices are nominal in the absence of a buying test.

Chicago—Scrap market weakness continues here with leading steelmaking grades down $1 to $2 a ton. Since early August the principal grades are off as much as $7 a ton. Further declines are a strong possibility. Only one mill has been a consistent buyer, others purchasing irregularly and sparingly.

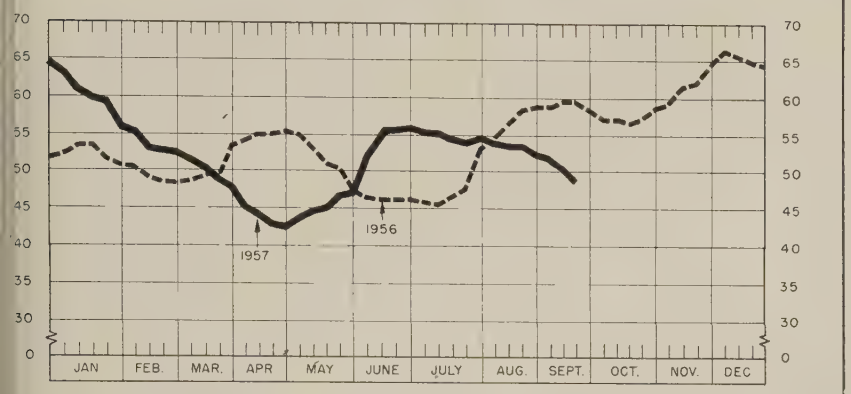
The five-day strike at the Indiana Harbor Works of Youngstown Sheet & Tube Co. halted blast furnace and steelmaking operations there. It was estimated the plant was consuming 1200 tons of purchased scrap daily when the strike was called.

Another strike, involving 150 crane operators at the Gadsden, Ala., plant of Republic Steel Corp., closed that works for about two days, idling some 5000 workers.

Detroit — Scrap prices tumbled again here as the local market ad-

STEELMAKING SCRAP PRICE COMPOSITE

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania—Compiled by STEEL



Sept. 18 1957	Week Ago	Month Ago	Year Ago	Aug. Avg.
$48.17	$50.17	$53.50	$59.67	$53.33

d to levels in line with those ther areas. The latest flurry ctivity was in bundles and ings, which slipped off several rs a ton. The foundry grades participating in the decline, al- gh there is little activity in area of demand.

eveland—There is practically uying in the local market, but age continues to move on old rs. The market undertone is k, and prices on the steelmak- grades are off another $1 a though the list is largely nom- in the absence of a repre- ative buy.

oungstown—The scrap market inues in the doldrums. There tle buying, and local mills ap- to be well supplied.

uffalo—A decline of $2 a ton ast scrap features the local ket. A small sale of cupola was made at $47, compared a previous price of $49. The e on No. 1 machinery cast also pped $2, being quoted at $52.

incinnati—Prices are off $1 to ton in a slow market. No. 1 vy melting is quoted $48-$49, kers' buying price. No. 2 dles fell $3, following the plac- of limited orders by a local sumer.

t. Louis — The scrap market continues weak and prices steadily softening. Most des have been marked down ther $1 to $3 a ton.

irmingham—Further weakness eloped in the scrap market here week, particularly in the elec- furnace grades. Open-hearth scrap consumers either are out of the market, or are buying sparingly. Purchases by a few of the larger foundries are keeping cast prices steady, but this segment of the market also appears easy.

Seattle—Scrap is moving at the slowest pace in months. Sales volume is down, but dealers expect improvement within 30 days. The mills hold large inventories and are buying sparingly. Prices are unchanged.

San Francisco — Demand for steel scrap here is slow. Material also is moving slowly to the market. The price undertone remains weak in the absence of exports to Japan—a strong bulwark earlier this year.

Warehouse . . .

Warehouse Prices, Page 172

The volume of business booked by distributors so far this month has been slightly better than the July-August average, but it is not as large as had been expected at most points.

Demand from the construction industry continues to be good, but most other users continue to reduce their inventories by restricting new purchases. The automotive industry has not come into the market for the large tonnages that are normal at this time of year.

Sales of sheets and cold-drawn bars are poor and are only moderate for hot-rolled bars and light plates. Distributors have well rounded stocks of plates except in some heavy, wide sizes. Wide flange beams are the only critically short item in most districts.

Prices are firm in all districts except Portland, Oreg., where price cutting is reported.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4160 tons, 12-story hospital, Great Lakes Training Station, Great Lakes, Ill., to Allied Structural Steel Co., Chicago; T. C. Bateson Construction Co., Dallas, general contractor.

3000 tons, office building, National Life Insurance Co., Montpelier, Vt., to Vermont Structural Steel Co., Burlington, Vt.; Gilbane Building Corp., Providence, R. I., general contractor.

1355 tons, plate girder bridge, Merrimack River, Concord, N. H., to American Bridge Div., U. S. Steel Corp., Pittsburgh; Monroe & Langstroth Co., Boston, general contractor.

620 tons, including 80 tons, joists, high school, Fontiac, Mich., to Overhead Conveyor Co., Ferndale, Mich.; Spence Bros., Saginaw, Mich., general contractor.

550 tons, test and qualification building, Redstone Arsenal, Huntsville, Ala., to Bibb Steel & Supply Co., Macon, Ga.; Batson-Cook Co., West Point, Ga., general contractor.

500 tons, state highway bridges, Wilmington-Woburn-Reading, Mass., to Tower Iron Works, Providence, R. I.; Campanella & Cardi Construction Co., Hillsgrove, R. I., general contractor.

300 tons, buildings and utilities, AFS, Bucks Harbor, Maine, to Bancroft & Martin Rolling Mills Co., South Portland, Maine; Consolidated Constructors Inc., Portland, Maine, general contractor.

270 tons, high school, Vernon, Conn., to Haarmann Steel Co., Holyoke, Mass.; A. F. Peaslee Inc., Hartford, Conn., general contractor; reinforcing Bars, U. S. Steel Supply Div., U. S. Steel Corp.

170 tons, craneway reinforcing, General Electric Co., Lynn, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.

140 tons, Garfield Street crossing, Seattle, to the Bethlehem Pacific Coast Steel Corp., Seattle; MacRae Bros., Seattle, general contractor.

STRUCTURAL STEEL PENDING

1875 tons, Washington State Hood Canal floating bridge; bids to Olympia, Wash., Oct. 15; project also involves 185 tons of bolts and washers, 115 tons of machinery, 20,150 sq ft of steel decking, 5844 ft of steel pipe, and 2450 ft of steel piling.

175 tons, Washington State Skagit County steel girder bridge; general contract to Louis Elterich Co. and Del Guzzi, Port Angeles, Wash., joint low and awarded at $470,536.

(*Please turn to Page* 183)

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Sept. 18, 1957. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Sept. 18	$48.17
Sept. 11	50.17
Aug. Avg	53.33
Sept. 1956	59.08
Sept. 1952	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*49.00-50.00*
No. 2 heavy melting	43.00-44.00
No. 1 factory bundles	*57.00-58.00*
No. 1 dealer bundles	*49.00-50.00*
No. 2 bundles	*38.00-39.00*
No. 1 busheling	*49.00-50.00*
Machine shop turnings	*39.00-30.00*
Mixed borings, turnings	*29.00-30.00*
Short shovel turnings	*32.00-33.00*
Cast iron borings	*32.00-33.00*
Cut structurals:	
2 ft. and under	*57.00-58.00*
3 ft length	*56.00-57.00*
Heavy turnings	*45.00-46.00*
Punchings & plate scrap	*56.00-57.00*
Electric furnace bundles	*56.00-57.00*

Cast Iron Grades

No. 1 cupola	*48.00-49.00*
Stove plate	42.00-43.00
Unstripped motor blocks	*33.00-34.00*
Clean auto cast	49.00-50.00
Drop broken machinery	*57.00-58.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*54.00-55.00*
Ralls, 2 ft and under	71.00-72.00
Rails, 18 in. and under	72.00-73.00
Angles, splice bars	61.00-62.00
Rails, rerolling	*70.00-71.00*

Stainless Steel Scrap

18-8 bundles & solids	*225.00-235.00*
18-8 turnings	*125.00-135.00*
430 bundles & solids	80.00-85.00
430 turnings	55.00-60.00

CLEVELAND

No. 1 heavy melting	*48.00-49.00*
No. 2 heavy melting	*39.00-40.00*
No. 1 factory bundles	*53.00-54.00*
No. 1 bundles	*48.00-49.00*
No. 2 bundles	*38.00-39.00*
No. 1 busheling	*48.00-49.00*
Machine shop turnings	*20.00-21.00*
Short shovel turnings	*24.00-25.00*
Mixed borings, turnings	*24.00-25.00*
Cast iron borings	*24.00-25.00*
Cut foundry steel	*48.00-49.00*
Cut structurals, plates 2 ft and under	*55.00-56.00*
Low phos. punchings & plate	*49.00-50.00*
Alloy free, short shovel turnings	*27.00-28.00*
Electric furnace bundles	*49.00-50.00*

Cast Iron Grades

No. 1 cupola	49.00-50.00
Charging box cast	39.00-40.00
Heavy breakable cast	37.00-38.00
Stove plate	46.00-47.00
Unstripped motor blocks	33.00-34.00
Brake shoes	37.00-38.00
Clean auto cast	50.00-51.00
Burnt cast	35.00-36.00
Drop broken machinery	52.00-53.00

Railroad Scrap

No. 1 R.R. heavy melt.	51.00-52.00
R.R. malleable	59.00-60.00
Rails, 2 ft and under	71.00-72.00
Rails, 18 in. and under	72.00-73.00
Rails, random lengths	64.00-65.00
Cast steel	62.00-63.00
Railroad specialties	64.00-65.00
Uncut tires	59.00-60.00
Angles, splice bars	64.00-65.00
Rails, rerolling	69.00-70.00

Stainless Steel
(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	230.00-240.00
18-8 turnings	130.00-140.00
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

YOUNGSTOWN

No. 1 heavy melting	*51.00-52.00*
No. 2 heavy melting	*43.00-44.00*
No. 1 bundles	*51.00-52.00*
No. 2 bundles	*40.00-41.00*
No. 1 busheling	*51.00-52.00*
Machine shop turnings	21.00-22.00
Short shovel turnings	27.00-28.00
Cast iron borings	27.00-28.00
Low phos.	*53.00-54.00*
Electric furnace bundles	*53.00-54.00*

Railroad Scrap

No. 1 R.R. heavy melt.	54.00-55.00

CHICAGO

No. 1 heavy melt., indus.	*51.00-52.00*
No. 1 hvy melt., dealer	*47.00-48.00*
No. 2 heavy melting	*40.00-41.00*
No. 1 factory bundles	*54.00-55.00*
No. 1 dealer bundles	*49.00-50.00*
No. 2 bundles	*36.00*
No. 1 busheling, indus.	*51.00-52.00*
No. 1 busheling, dealer	*47.00-48.00*
Machine shop turnings	*28.00-29.00*
Mixed borings, turnings	*30.00-31.00*
Short shovel turnings	*30.00-31.00*
Cast iron borings	*30.00-31.00*
Cut structurals, 3 ft	*52.00-53.00*
Punchings & plate scrap	*53.00-54.00*

Cast Iron Grades

No. 1 cupola	44.00-45.00
Stove plate	42.00-43.00
Unstripped motor blocks	34.00-35.00
Clean auto cast	49.00-50.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	*53.00-54.00*
R.R. malleable	58.00-59.00
Rails, 2 ft and under	66.00-67.00
Rails, 18 in. and under	67.00-68.00
Angles, splice bars	*60.00-61.00*
Axles	*64.00-65.00*
Rails, rerolling	*64.00-65.00*

Stainless Steel Scrap

18-8 bundles & solids	225.00-235.00
18-8 turnings	125.00-135.00
430 bundles & solids	90.00-100.00
430 turnings	60.00-70.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*43.00-44.00*
No. 2 heavy melting	*37.00-38.00*
No. 1 bundles	*43.00-44.00*
No. 2 bundles	*30.00-31.00*
No. 1 busheling	*43.00-44.00*
Machine shop turnings	*23.00-24.00*
Mixed borings, turnings	*24.00-25.00*
Short shovel turnings	*26.00-27.00*
Punchings & plate scrap	*49.00*

Cast Iron Grades

No. 1 cupola	*48.00*
Stove plate	44.00
Charging box cast	44.00
Heavy breakable	43.00
Unstripped motor blocks	*33.00*
Clean auto cast	*49.00*
Malleable	*51.00†*

†Nominal

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*46.00*
No. 2 heavy melting	*43.00*
No. 1 bundles	*46.00*
No. 2 bundles	*37.00*
No. 1 busheling	*46.00*
Machine shop turnings	*30.00*
Short shovel turnings	32.00

Cast Iron Grades

No. 1 cupola	47.00
Charging box cast	*42.00*
Heavy breakable cast	*42.00*
Unstripped motor blocks	*42.00*
Brake shoes	40.00
Clean auto cast	48.00
Stove plate	44.00

Railroad Scrap

No. 1 R.R. heavy melt.	*52.00*
Rails, 18 in. and under	*69.00*
Rails, random lengths	*60.00*
Rails, rerolling	*70.00*
Angles, splice bars	59.00

PHILADELPHIA

No. 1 heavy melting	*45.50*
No. 2 heavy melting	*40.00*
No. 1 bundles	*46.50*
No. 2 bundles	*36.50*
No. 1 busheling	*46.50*
Electric furnace bundles	*50.00*
Mixed borings, turnings	*28.00*
Short shovel turnings	*30.00*
Machine shop turnings	*26.00*
Heavy turnings	*41.50*
Structural & plate	54.00-55.00
Couplers, springs, wheels	*63.50*
Rail crops, 2 ft & under	69.00-71.00

Cast Iron Grades

No. 1 cupola	*46.00-47.00*
Heavy breakable cast	*50.50*
Malleable	*61.00*
Drop broken machinery	56.00-57.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*45.00-46.00*
No. 2 heavy melting	*36.00-37.00*
No. 1 bundles	*45.00-46.00*
No. 2 bundles	*30.00-31.00*
Machine shop turnings	*16.00-17.00*
Mixed borings, turnings	*17.00-18.00*
Short shovel turnings	*18.00-19.00*
Low phos. (structural & plate	*49.00-50.00*

Cast Iron Grades

No. 1 cupola	*45.00-46.00*
Unstripped motor blocks	*38.00-39.00*
Heavy breakable	*44.00-45.00*

Stainless Steel

18-8 sheets, clips, solids	*190.00-200.00*
18-8 borings, turnings	*90.00-100.00*
430 sheets, clips, solids	65.00-75.00
410 sheets, clips, solids	50.00-55.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	38.00-39.00
No. 2 heavy melting	*32.00-33.00*
No. 1 bundles	38.00-39.00
No. 2 bundles	*29.00-30.00*
No. 1 busheling	38.00-39.00
Machine shop turnings	18.00-18.50
Mixed borings, turnings	19.00-19.50
Short shovel turnings	20.00-21.00
No. 1 cast	33.00-34.00
Mixed cupola cast	32.00-33.00
No. 1 machinery cast	41.00-42.00

BUFFALO

No. 1 heavy melting	47.00-48.00
No. 2 heavy melting	40.50-41.50
No. 1 bundles	47.00-48.00
No. 2 bundles	37.50-38.50
No. 1 busheling	47.00-48.00
Mixed borings, turnings	31.00-32.00
Machine shop turnings	29.00-30.00
Short shovel turnings	32.00-33.00
Cast iron borings	33.00-34.00
Low phos.	53.00-54.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*46.00-47.00*
No. 1 machinery	*51.00-52.00*

Railroad Scrap

Rails, random lengths	61.00-62.00
Rails, 3 ft and under	66.00-67.00
Railroad specialties	59.00-60.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	48.00-49.00
No. 2 heavy melting	*42.00-43.00*
No. 1 bundles	*48.00-49.00*
No. 2 bundles	*35.00-36.00*
No. 1 busheling	*48.00-49.00*
Machine shop turnings	30.00-31.00
Mixed borings, turnings	26.00-27.00
Short shovel turnings	33.00-34.00
Cast iron borings	26.00-27.00
Low phos. 18 in.	*55.00-56.00*

Cast Iron Grades

No. 1 cupola	*43.00-44.00*
Heavy breakable cast	*39.00-40.00*
Charging box cast	*39.00-40.00*
Drop broken machinery	*52.00-53.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*50.00-51.00*
Rails, 18 in. and under	*70.00-71.00*
Rails, random lengths	*63.00-64.00*

BIRMINGHAM

No. 1 heavy melting	46.00-47.00
No. 2 heavy melting	36.00-37.00
No. 1 bundles	46.00-47.00
No. 2 bundles	*29.00-30.00*
No. 1 busheling	46.00-47.00
Cast iron borings	27.00-28.00
Short shovel turnings	*33.00-34.00*
Machine shop turnings	*31.00-32.00*
Bar crops and plates	*52.00-53.00*
Structurals & plate	*51.00-52.00*
Electric furnace bundles	*47.00-48.00*
Electric furnace:	
3 ft and under	*45.00-46.00*
2 ft and under	*46.00-47.00*

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	54.00-55.00
Stove plate	54.00-55.00
Unstripped motor blocks	44.00-45.00
Charging box cast	37.00-38.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	*50.00-51.00*
Rails, 18 in. and under	*59.00-60.00*
Rails, rerolling	62.00-63.00
Rails, random lengths	*53.00-54.00*
Angles, splice bars	*55.00-56.00*

SEATTLE

No. 1 heavy melting	42.00
No. 2 heavy melting	40.00
No. 1 bundles	40.00
No. 2 bundles	29.00
Machine shop turnings	27.00
Mixed borings, turnings	27.00
Electric furnace No. 1	48.00

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast	35.00
Unstripped motor blocks	30.50
Stove plate (f.o.b. plant)	28.00

LOS ANGELES

No. 1 heavy melting	*46.00*
No. 2 heavy melting	*44.00*
No. 1 bundles	*45.00*
No. 2 bundles	*35.00*
Machine shop turnings	*35.00*
Shoveling turnings	*32.00*
Cast iron borings	*31.00*
Cut structural and plate, 1 ft and under	*60.00*

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*52.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*46.00*

SAN FRANCISCO

No. 1 heavy melting	44.00
No. 2 heavy melting	42.00
No. 1 bundles	43.00
No. 2 bundles	*35.00*
Machine shop turnings	30.00
Mixed borings, turnings	30.00
Cast iron borings	30.00
Heavy turnings	30.00
Short shovel turnings	30.00
Cut structurals, 3 ft	*50.00*

Cast Iron Grades

No. 1 cupola	*52.00*
Charging box cast	*45.00*
Stove plate	46.00
Heavy breakable cast	40.00
Unstripped motor blocks	*49.00*
Clean auto cast	*52.00*
No. 1 wheels	*45.00*
Drop broken machinery	*52.00*

HAMILTON, ONT.

No. 1 heavy melting	50.00
No. 2 heavy melting	45.00
No. 1 bundles	50.00
No. 2 bundles	39.00
Mixed steel scrap	47.00
Mixed borings, turnings	24.00
Busheling, new factory:	
Prepared	50.00
Unprepared	44.00
Short steel turnings	30.00
Rails, rerolling	61.00

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b. Hamilton, Ont.

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Copper Shows Some Gains

Custom smelters raise prices 1 cent, but fluctuations in London and continued overproduction keep market uncertain. Lead and zinc still stable both here and abroad

Nonferrous Metal Prices, Pages 182 & 183

COPPER PRICES have shown some unexpected strength recently, raising hopes in many quarters that the primary quotation (27 cents a pound) may not go any lower.

Pickups—The recent upturn in foreign quotations encourged custom smelters to boost their prices by 0.5 cent a pound on Sept. 12. On Sept. 13, custom smelters again raised their price 0.5 cent to 26 cents a pound because of a buying flurry that resulted from the first price increase. But custom smelters report sales are little better than they were before the increase.

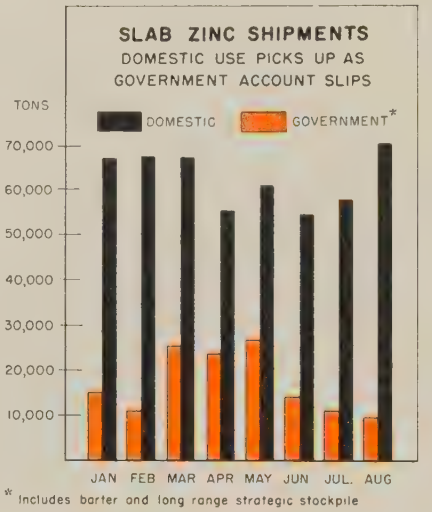
Stabiliation of the domestic price will probably hinge on how well foreign quotations hold up, say metalsmen. On Sept. 17, the London Metal Exchange was quoting close to 24.4 for primary (add 0.75 cent a pound for freight, delivered New York), a downward fluctuation from the previous week. On the same day, the Rhodesian Selection Trust stood at 25 cents a pound and Katanga copper was at 25.5 cents a pound, c.i.f., New York.

No one in the copper business is saying prices both here and abroad won't go down. But there are mild tones of optimism in the market. Examples: Several observers see custom smelted copper going up another 0.5 to 0.75 cent a pound shortly. Many feel the price of primary may have hit bottom, too—some even predict a 1 to 2 cent a pound rise within a few weeks.

Unchanged—Regardless of the other economic factors, copper's big problem still remains overproduction. Consumption hasn't declined as much this year as the falling price pattern would indicate.

Statistics just released by the Copper Institute show that world refined production of copper was 232,169 tons in August, a slight fall from the July total of 239,365 tons.

On the domestic scene, refined production showed a slight increase: 127,434 tons in July, 128,480 tons in August. Stocks went up, too—they totaled 191,515 tons in July and 192,931 tons in August. But the real jump came in domestic deliveries to fabricators which rose from 84,702 tons in July to 107,522 tons in August.



Cutting?—The expected rash of production curtailments hasn't arrived, but many industry observers say it's only a matter of time. Three developments: 1. Calumet & Hecla Inc. will suspend operations at several of its mines and concentrate facilities in the Michigan area. 2. The Chilean government is closing some marginal mines which have an average production of 35,000 tons a year. 3. Phelps Dodge Corp. cut output of its Arizona open pit mines another 5 per cent, bringing total cuts to 3500 tons a month so far. Previously, Anaconda Co. had cut domestic operations by 3000 tons a month.

Lead and Zinc Steady

Producers report sales are fair. Zinc buying has slacked off a little from the August flurry, but sales are still better than they were in June and July.

The price of both metals appears stable. Lead has been hovering at over 11 cents on the London Metal Exchange (add 1.85 cents a pound for freight and duty, delivered New York); zinc is staying near the 9.5 cents a pound figure (add 1.5 cents for duty and freight). Producers see little likelihood of a price upturn until the government takes some action on the proposed tariffs.

American Zinc Institute Inc. reports production in August was 84,166 tons, a slight decrease from July's 85,779 tons. Domestic shipments were 57,862 tons in July and hit 70,318 tons in August (see chart). But stocks rose over 3000 tons in this period—now stand at 149,296.

NONFERROUS PRICE RECORD

	Price Sept. 18	Last Change	Previous Price	Aug. Avg	July Avg	Sept., 1956 Avg
Aluminum ..	28.10	Aug. 1, 1957	27.10	28.100	27.100	27.100
Copper	26.00–27.00	Sept. 12, 1957	25.50–27.00	28.639	28.822	39.500
Lead	13.80	June 11, 1957	14.80	13.800	13.800	15.800
Magnesium .	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	64.500
Tin	94.125	Sept. 18, 1957	93.75	94.259	96.576	103.745
Zinc	10.00	July 1, 1957	10.50	10.000	10.000	13.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.

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ke, for example, its use by Chicago Pneumatic Tool New York, N. Y., in the oil pump gears used in their y portable and stationary Class "P" compressors.

ese gears pump the lubricating oil which seals rotary ressor vane clearances, lubricates vital parts and cools the air during compression. In meeting the se requirements of this job, Duronze's combination gh strength, wear resistance and machinability are ly important advantages.

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Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 26.00; ingots, 28.10, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 29.90; No. 43, 29.70; No. 195, 31.30; No. 241, 31.50; No. 356, 29.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100-lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $120 per lb, nom.

Copper: Electrolytic, 27.00 deld.; custom smelters, 26.00; lake, 27.00 deld.; fire refined, 26.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $86-110 nom. per troy oz.

Lead: Common, 13.80; chemical, 13.90; corroding, 13.90, St. Louis, New York basis, add 0.20.

Lithium: 98+%, cups or ingots, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $245-250 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: $80-100 per troy oz, nom.

Palladium: $21-24 per troy oz.

Platinum: $81-87 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $10.50 per lb, commercial grade.

Silver: Open market, 90.625 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55, per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 94.125.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.), $2.25; grade A-2 (0.5% Fe max.), $2.00 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.50 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $4.10-4.20.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50,East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 11.35; special high grade, 11.75 deld. Die casting alloy ingot No. 3, 14.25; No. 2, 15.25; No. 5, 14.75 deld.

Zirconium: Sponge, commercial grade, $5-10 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.75-30.25; No. 12 foundry alloy (No. 2 grade), 21.75-23.00; 5% silicon alloy, 0.60 Cu max., 25.50-26.00; 13 alloy, 0.60 Cu max., 25.50-26.00; 195 alloy, 24.75-26.75; 108 alloy, 22.25-23.00. Steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 23.75; grade 2, 22.00; grade 3, 20.75; grade 4, 19.00.

Brass Ingot: Red brass, No. 115, 27.75; tin bronze, No. 225, 37.00; No. 245, 31.25; high-leaded tin bronze, No. 305, 31.75; No. 1 yellow, No. 405, 22.50; manganese bronze, No. 421, 25.50

Magnesium Alloy Ingot: AZ63A, 40.75; AZ91B, 37.25; AZ91C, 40.75; AZ92A, 40.75.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.82, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.80, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 32.355; l.c.l., 32.98. Weatherproof, 30,000-lb lots, 33.66; l.c.l., 34.78. Magnet wire deld., 40.43, before quantity discount.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $19.50 per cwt; pipe, full coils, $19.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $9.50-15.95; sheared mill plate, $8.00-11.50; wire, $7.50-11.50; forging billets, $6.00-7.60; hot-rolled and forged bars, $6.15-7.90.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates, 19.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.00-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.249-0.136	43.10-47.60	....
0.135-0.096	43.60-48.70	40.50-41.10
0.095-0.077	44.30-50.50	40.60-41.30
0.076-0.061	44.90-52.80	40.80-42.00
0.060-0.048	45.60-55.10	41.40-43.10
0.047-0.038	46.20-57.90	41.90-44.50
0.037-0.030	46.60-62.90	42.30-46.30
0.029-0.024	47.20-54.70	42.60-47.00
0.023-0.019	48.20-58.10	43.70-45.40
0.018-0.017	49.00-55.40	44.30-46.00
0.016-0.015	49.90-56.30	45.10-46.80
0.014	50.90	46.10-47.80
0.013-0.012	52.10	46.80
0.011	53.10	48.00
0.010-0.0095	54.60	49.40
0.009-0.0085	55.90	50.90
0.008-0.0075	57.50	52.10
0.007	59.00	53.60
0.006	60.60	55.00

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.70	47.50
5050-F	43.80	48.60
3004-F	44.80	50.50
5052-F	45.40	51.20
6061-T6	46.90	53.00
2024-T4*	50.60	57.40
7075-T6*	58.40	66.00

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	78.20	75.20	....	....
0.156-0.172	66.20	63.40	....	....
0.188	66.20	63.40	....	81.60
0.219-0.234	63.00	61.50	....	....
0.250-0.281	63.00	61.50	....	77.90
0.313	63.00	61.50	....	74.20
0.344	62.50	....	....	....
Cold-Finished				
0.375-0.547	62.50	61.30	74.80	69.80
0.563-0.688	62.50	61.30	71.10	65.50
0.719-1.000	61.00	59.70	64.90	61.70
1.063	61.00	59.70	....	59.60
1.125-1.500	58.60	57.40	62.80	59.60
Rolled				
1.563	57.00	55.70	....	....
1.625-2.000	56.30	54.90	....	57.50
2.125-2.500	54.80	53.40	....	....
2.563-3.375	53.20	51.70	....	....

Forging Stock: Round, Class 1, 45.20-58.60 in specific lengths, 36-144 in., diam. 0.375-8 in. Rectangles and squares, Class 1, 50.50-66.60 in random lengths, 0.375-4 in. thick, width 0.750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$19.40	2	$ 59.90
1	30.50	4	165.05
1¼	41.30	6	296.10
1½	49.40	8	445.55

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45.40-47.00	60.60-64.80
12-14	45.70-47.20	61.30-65.80
15-17	45.90-47.90	62.50-67.50
18-20	46.50-48.30	64.50-70.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Thread plate, .188 in., 71.70; .250-2.00 in., 70.60. Tooling plates, .250-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 13.50-14.00; old sheets, 10.50-11.00; borings and turnings, 6.50

BRASS MILL PRICES

MILL PRODUCTS a — SCRAP ALLOWANCES

	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turning
Copper	49.13b	46.36c	....	49.32	23.000	23.000	22.250
Yellow Brass	43.02	31.30d	43.56	45.93	17.375	17.125	15.750
Low Brass, 80%	45.50	45.44	46.04	48.31	19.500	19.250	18.750
Red Brass, 85%	46.37	46.31	46.91	49.18	20.250	20.000	19.500
Com. Bronze, 90%	47.78	47.72	48.32	50.34	21.000	20.750	20.250
Manganese Bronze	51.01	45.11	55.61	....	16.125	15.875	15.375
Muntz Metal	45.39	41.20	....	....	16.375	16.125	15.625
Naval Brass	47.27	41.58	54.33	50.68	16.125	15.875	15.375
Silicon Bronze	53.76	52.95	53.80	55.74e	22.625	22.375	21.825
Nickel Silver, 10%	59.43	61.75	61.75	....	23.625	23.375	11.813
Phos. Bronze, A-5%	68.07	68.57	68.57	69.75	23.750	23.500	22.500

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

rankcases, 10.50-11.00; industrial cast-0.50-11.00.

and Brass: No. 1 heavy copper and 7.75-18.25; No. 2 heavy copper and wire, 3.75; light copper, 14.25-14.75; No. 1 ition red brass, 16.00-16.50; No. 1 com- turnings, 15.50-16.00; yellow brass s, 9.50-9.75; new brass clippings, 4.50; light brass, 10.00-10.50; heavy brass, 12.00-12.50; new brass rod ends, 3.50; auto radiators, unsweated, 12.50- cocks and faucets, 13.00-13.50; brass 3.50-14.00.

Heavy 9.50-10.00; battery plates, 0; linotype and stereotype, 11.50-12.00; ype, 10.00-10.50; mixed babbitt, 11.00-

Clippings, 35.00-40.00; old sheets, 3.00; turnings, 24.00-30.00; rods, 35.00-

Sheets and clips, 50.00-55.00; rolled 50.00-55.00; turnings, 45.00-50.00; ds, 50.00-55.00.

Old zinc, 3.00-3.25; new diecast scrap, 0; old diecast scrap, 1.50-1.75.

REFINERS' BUYING PRICES

per pound, carlots, delivered refinery)

um: 1100 clippings, 16.50-17.50; 3003 s, 16.50-17.50; 6151 clippings, 16.00- 5052 clippings, 16.00-17.00; 2014 clip- 15.50-17.00; 2017 clippings, 15.50-17.00; lippings, 15.50-17.00; mixed clippings, 6.00; old sheets, 13.00-13.50; old cast, 3.50; clean old cable (free of steel), 6.50; borings and turnings, 13.50-15.00.

m Copper: Heavy scrap, 0.020-in. and , not less than 1.5% Be, 53.00; light 48.00; turnings and borings, 33.00.

and Brass: No. 1 heavy copper and 21.50; No. 2 heavy copper and wire, light copper, 17.75; refinery brass copper) per dry copper content, 19.25.

NGOTMAKERS' BUYING PRICES

ents per pound, carlots, delivered)

and Brass: No. 1 heavy copper and 21.50; No. 2 heavy copper and wire, light copper, 17.75; No. 1 composition , 18.25; No. 1 composition solids, 18.75; yellow brass solids, 13.00; yellow brass s, 12.00; radiators, 14.40.

PLATING MATERIALS

shipping point, freight allowed on ies)

ANODES

m: Special or patented shapes, $1.70

: Flat-rolled, 45.29; oval, 43.50, 5000- lb; electrodeposited, 35.75, 2000-5000 ; cast, 36.25, 5000-10,000 quantities.

: Depolarized, less than 100 lb, 114.25; lb, 112.00; 500-4999 lb, 107.50; 5000- lb, 105.25; 30,000 lb, 103.00 Carbonized, 3 cents a lb.

ar or slab, less than 200 lb, 112.50; 200- 111.00; 500-999 lb, 110.50; 1000 lb or 110.00.

Balls, 17.50; flat tops, 17.50; flats, ovals, 18.50, ton lots.

CHEMICALS

m Oxide: $1.70 per lb in 100-lb drums.

ic Acid: 100 lb, 33.30; 500 lb, 32.80; , 32.15; 5000 lb, 31.80; 10,000 lb, 31.30, Detroit.

Cyanide: 100-200 lb, 74.80; 300-900 80.

Sulphate: 100-1900 lb, 14.55; 2000-5900 55; 6000-11,900 lb, 12.30; 12,000-22,900 05; 23,000 lb or more, 11.55.

Chloride: Less than 400 lb, 35.00; 400- , 33.00; 10,000 lb, 32.50.

Sulphate: 5000-22,000 lb, 33.50; 23,000- lb, 33.00; 36,000 lb or more, 32.50.

Cyanide: 100 lb, 27.60; 200 lb, 25.90; 22.90; 1000 lb, 21.90; f.o.b. Detroit.

Stannate: Less than 100 lb, 75.20; 100- 66.20; 700-1900 lb, 63.50; 2000-9900 lb, 10,000 lb or more, 60.30.

us Chloride (anhydrous): Less than 25 4.70; 25 lb, 129.70; 100 lb, 114.70; 400 2.20; 5200-19,600 lb, 100.00; 20,000 lb or 87.80.

us Sulphate: Less than 50 lb, 127.50; 50 50; 100-1900 lb, 95.50; 2000 lb or more,

Cyanide: 100-200 lb, 59.00; 300-900 lb,

CLASSIFIED

Help Wanted

FOUNDRY SUPERINTENDENT for jobbing foundry in New England producing carbon, low alloy and stainless castings. Must have practical and technical background, be cost minded and be able to assume responsibility. In reply include complete resume giving experience, background, availability, age, salary expected, etc. Reply to Box 594, STEEL, Penton Bldg., Cleveland 13, Ohio.

Accounts Wanted

ENGINEER WISHES TO REPRESENT manufacturer of equipment for heavy industrials central and eastern Penna. Reply Box No. 595, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

SALES ENGINEER, TOOL STEEL AND specialty steels, fifteen years experience with one firm. Prefer New Jersey, New York, Connecticut territory. Reply Box 596, STEEL, Penton Bldg., Cleveland 13, Ohio.

CLASSIFIED RATES

All classifications other than "Positions Wanted" set solid. 50 words or less $15.00, each additional word .30, all capitals, 50 words or less $19.20, each additional word .38; all capitals leaded, 50 words or less $23.40, each additional word .47. "Positions Wanted" set solid, 25 words or less $3.60, each additional word .14, all capitals, 25 words or less $4.50, each additional word .18; all capital leaded, 25 words or less $5.40, each additional word .22. Keyed address takes seven words. Cash with order necessary on "Positions Wanted" advertisements. Replies forwarded without charge. Displayed classified rates on request. Address your copy and instructions to STEEL, Penton Building, Cleveland 13, Ohio.

(*Concluded from Page 177*)

REINFORCING BARS . . .

REINFORCING BARS PLACED

1200 tons, hospital building, Great Lak Training Center, Great Lakes, Ill., to Ce Steel Products Co., Chicago; T. C. Bates Construction Co., Dallas, general contract

270 tons, high school, Pontiac, Mich., to Poll Steel Co., Cincinnati; Spence Bros., Saginaw Mich., general contractor.

450 tons, estimated, warehouses and facilitie Olmstead AFB, Middletown, Pa., to Sweet Steel Co., Williamsport, Pa.; Ritter Bro Harrisburg, Pa., general contractor.

270 tons, pavement and substructure, Conne ticut River bridge, Windsor Locks-Ea Windsor, to Scherer Steel Co., East Har ford; M. A. Gammino Construction Co Providence, R. I., general contractor.

450 tons, state highway bridges, Wilmington Woburn-Reading, Mass., to Plantations Ste Co., Providence, R. I.; Campanella & Car Construction Co., Hillsgrove, R. I., gener contractor.

200 tons, including structurals, high schoo Warren, R. I., to Plantations Steel Co Providence, R. I.; Donatelli Building C Inc., North Providence, R. I., general co tractor; 85 tons, structurals, Providen Steel & Iron Co.

250 tons, a 527-ft steel truss span, Rog River, Oregon, to Poole, McGonigle Dick, Portland, Oreg.; Tom Lillebo, Reed port, Oreg., general contractor, low $243,454 to the Bureau of Public Roads.

190 tons, test building, Redstone arsena Huntsville, Ala., to Conners Steel Div H. K. Porter Company Inc., Birmingham Batson-Cook Co., West Point, Ga., gener contractor.

115 tons, bridge near Forks, Wash., for t Bureau of Public Roads, to an unstat fabricator.

100 tons, buildings and facilities, AFS, Buck Harbor, Maine, to Bancroft & Martin Rol ing Mills Co., South Portland, Maine; Co solidated Constructors Inc., Portland, Main general contractor.

100 tons, or more, addition, medical researc laboratory, Yale University, New Haven Conn., to Joseph T. Ryerson & Son Inc Boston; Dwight Building Co., Hamden Conn., general contractor.

REINFORCING BARS PENDING

6300 tons, also unstated for prestressin reinforcinement, Washington State Hoo Canal floating bridge, 1.341 miles in length also miscellaneous steel items; bids t Olympia, Wash., Oct. 15.

350 tons, Washington State road project Pierce County; bids to Olympia, Wash Oct. 1.

225 tons, Skagit River bridge approache Washington State project; general contrac to Louis Elterich Co., Port Angeles, Wash low at $470,536.

260 tons, two flat slab bridges, Washingto State project, Whatcom County; bids t Olympia, Wash., Oct. 1.

150 tons plus, Howard Creek Canal an Little Beaver Creek Dam, Rogue Rive project, Oregon; Cherf Bros., S. Birch Sons and D. L. Cheney, Ephrata, Wash low at $1,285,057, to the Bureau of Re clamation.

PLATES . . .

PLATES PENDING

500 tons, Cougar Dam, Oregon, 1540 ft o 72 and 108-in. plate pipe; J. W. Briggs Bend, Oreg., is low at $1,527,020 to th U. S. Engineer, Portland, Oreg.

PIPE . . .

CAST IRON PIPE PLACED

500 tons, Portland District improvements t the Pacific States Cast Iron Pipe Co., Port land, Oreg.

CAST IRON PIPE PENDING

2000 tons (estimated) various district im provements; bids soon to Seattle.

STEEL PIPE PLACED

Unstated, 16,600 ft of 10 in., to Armc Drainage & Metal Co., Portland, Oreg., low at $45,835 to Kettle Falls, Wash.